The Builder.

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Economic Science, and the State Purchase of Railways.

THE PRACTICAL KEY TO THE PROBLEM.

THE discussion, on August 29th, by the Section for Economic Science and Statistics of the British Association, of Mr. Watherston's paper, "A Plea for Unity of Administration of Railways," is hardly calculated to support the claim of an annual occasion of the kind to produce work more striking or more valuable than that which, week after week, is brought forward in the columns of the scientific press. It would be difficult more pregnantly to illustrate the difference between the steady worker, kept in the groove by a sense of public, although unnamed, responsibility, and the brilliant or the hasty essayist, than was afforded by the debate in question, whilst the great public interest taken in the subject has been insisted on, and ably enforced, by the *Manchester Guardian*. With the starting-point taken by Mr. Watherston, and with his views of what is desirable,—if only it were possible,—we fully agree. But we regret that the question of feasibility should not be put in the first rank, as this precaution would effect a great saving of time and of argument. Captain Douglas Galton touched upon the first points to which we have to refer, but was not prepared to go into them with that precision which is requisite in order to obtain definite results. How much railway capital, he inquired, is debenture or preference stock? Let us see.

That theoretically railways "ought to be public property," we hold to be indisputable. It is quite another thing to ask whether, after Parliament has authorised the spending of 745 millions by private companies on the construction of 18,000 miles of line, it is feasible to make the change; and further, if feasible, would the public be the gainer?

In the first place, out of the 728,000,000*l.* of railway capital existing at the end of 1880, 182,000,000*l.* has been raised by loans and debenture stock, and 276,000,000*l.* by guaranteed or preferential capital. This leaves only 270,000,000*l.* of ordinary capital,—a consideration of no little importance in attempting a practical view of the question. On the whole capital of 728 millions, the interest divided amounted to 4·38 per cent. This, then, is the value of the property to be acquired by the nation in order to carry out Mr. Watherston's plan. If converted into three per cent. stock, it would represent an amount of 1,062 millions sterling; and the annual interest for which the State would thus become responsible would be nearly 50 per cent. more than that now paid on the National Debt! But this is allowing nothing to the shareholders for compulsory purchase,—a feature of some importance in the case. Again, out of the 458 millions of loan, debenture, preference, and guaranteed capital, very little more than 13 millions now pays less than three per cent. interest. The bulk of the remainder receives between three and five per cent., and small sums run up to as much as 10 and even 15 per cent. It is thus evident that the Government would require more than the present net earnings of 32 millions to save themselves from loss by the transaction; probably considerably more. And this being so, from what source is any abatement of tariff to be made up? Either the railway customers, or the nation, would have to pay, and that no inconsiderable sum, for the mere transference of the property. Thus the first financial requisite, that of the lowering of rates and taxes, would be defeated by the charge made in order to secure it.

As to saving in working expenses, Captain Galton remarked that it could not possibly exceed some 500,000*l.* or 600,000*l.* out of a gross expenditure of 34,000,000*l.* sterling. It has yet to be shown that any saving whatever would be effected by the change. The only direct experience bearing on the question is that of the French, Belgian, and Italian railways, and that is to the effect that Government management is at the same time the most costly and the least efficient. Some paid chairmen and directors would, no doubt, disappear; but it is not to be thought that these gentlemen are paid for doing nothing; and how far their duties, whatever they may be, would be more cheaply and efficiently discharged by Government officials, has to be shown. As far as our own knowledge extends, we should say that the railway servants of the United Kingdom are as industrious, efficient, and as far from over-paid a body of men as can be found anywhere in the world, and we think there is every reason to expect that the substitution of Government management for that of the representatives of shareholders, interested in the cheap working of their lines, would be a steady and notable rise in the wages of every department of the great system, as compared with the work done.

At the same time, we would be the last persons to throw cold water on any serious discussion of the subject of the ultimate freedom of our railways. It is only when the question is approached without a full view of the magnitude of the difficulties that attend it that we have anything to say as a protest. For the State to purchase the property of the railway companies we hold would be a ruinous mistake. And this opinion we share with those French and Belgian statesmen who have studied the subject with clear and impartial intelligence, and at the same time with a knowledge and command of statistics that are not attainable as to English railways. But the prospect of the continuance of the English railway system as a source of mercantile profit to the capitalists who have found the money for making the lines is one that is attended by grave menace to the country. Within a short time the manufacturers of France and of Belgium will be able to command water-carriage at cost price, and railway carriage at very little more than cost price. To pay the modest 4½ per cent., which is only the net earning of our railway capital,—double freights and fares,—how will our manufacturers hold their own against those of the Continent who have only half as much to pay for transport as they have? This is a question not theoretic, but practical; not a long way off, but at the door; not to be brushed aside with the policy of the ostrich, but to be looked in the face.

Take one example, to show how the matter comes home. The value of copperas is less than 30s. per ton. Large works for the manufacture of alum and of copperas exist at Manchester. The rate charged by the railway companies for conveying this cheap undamageable material, in large quantities, from Manchester to Liverpool, or to Garston, is 7s. 6d. per ton,—more than a fourth of the selling price! But for conveying it to Glasgow, it is no less than 21s. 8d. per ton; while at the same time sugar, which is worth 20*l.* per ton, is conveyed for the same distance for 13s. 4d.! The distance is 225¼ miles. The cost of conveyance by canal would be about 6s. 3d., if a line of canal existed; and the cost by canal to the Mersey, and thence by sea to Glasgow, would probably be less. We think it probable that if the railway charges were based on the two elements of actual cost of transport and proportionate profit, from 16s. to 19s. per ton would be a fair charge to Glasgow, and something under 3s. a ton to Liverpool, as against 1s. by canal. The manufacturers in this case naturally complained before the Select Committee on Railways (Rates and Fares) as to inequality of charge. But there is something even more serious, as far as the country is concerned, than this inequality. It is the fact that the railway companies have closed the old routes from Manchester to Liverpool and from Manchester to Birmingham by water, while at the same time they cannot themselves (with justice to their shareholders) carry the material in question for the longer distance at a price that it can afford. To stop water-carriage from Manchester to Glasgow is to shut up chemical works at the former spot, in so far as sale at the latter spot is concerned. It is this injury done to the manufacturers, without any corresponding benefit

to themselves, that forms the real nut which the English public has to crack with the English railway companies.

Not a week passes without some fresh indication of the vivid interest which this question of the cost of transport is exciting among all branches of industry. As to its intimate connexion with the welfare of the building trade we have already spoken on former occasions, and also of that displacement of the centres of activity of this trade which has been shown in consequence of the improvement of the free waterways of the Clyde, the Tyne, and the Wear. On the other hand, we hear from one of the Conservators of the Thames that the transport on that river above the Thames now amounts to little more than one-tenth of what it was twenty years ago; and that notwithstanding the outlay of 100,000*l.* by the Conservators on that part of the river. How far continued activity of the Conservators is called for, the destructive floods that have devastated this fair valley not so very long ago bear witness. But the income of the Conservators depends on the traffic. The traffic has been strangled by cutting off the through communication, which was formerly afforded by the Oxford, the Coventry, and the Birmingham canals, between the Thames, the Trent, and the Mersey. The control obtained by the London and North-Western Railway over the once rich and active Birmingham Canal, and the purchase of the Ashby-de-la-Zouch Canal by the Midland Railway, have blocked the connexion between these rivers. The income of the two former canals has fallen, in consequence, to about one-fourth of what it was in 1830. The Thames itself is a fellow-sufferer. And of the enormous increase which we lately chronicled of building on the banks of the northern rivers, how much, let us ask, has been driven by the obstruction of the waterway from the valley of the Thames?

The physical advantages which England offers to the manufacturer are, first, her mineral wealth, in which she is not unrivalled; and secondly, the easy maritime access to her numerous ports, in which she is without a competitor,—speaking, of course, of the whole United Kingdom. For inland railway carriage England is, and probably always will be, at a disadvantage as compared with many parts of the Continent. Her railways have cost half as much again to make, and cost considerably more to work than most of the Continental lines. Thus, as far as railway carriage is relied on, the Continent has the advantage. But in so far as we can bring the sea inland, make our rivers and canals free, or carry the imports from our coasts inland at the least expense,—in so far do we strengthen the natural economical defences of the kingdom, and fortify a position which is in some respects unique.

Most unfortunately the railway managers have taken a view of the mode of working their lines which is diametrically opposite to the idea that her maritime facilities are the great stronghold of England. When coasting trade exists between two points also connected by railway, the companies carry between such points at fares calculated to compete with the sea passage, although it is certain that little if any profit can be thus obtained. But where a town is some little way inland, and is dependent on railway communication, then they strain their charges to the utmost legal limit. It may be questioned whether this is really a paying policy for the railways. It is certain that it is a losing policy for the country.

To meet this great difficulty by the purchase, on the part of the State, of from seven to eight hundred millions worth of railway capital, is, we hold, quite out of the question. But there is another step which *is* within our power, and to which we think that the efforts of reformers might be successfully directed. Eight hundred millions would not be enough to purchase our railways. But twenty millions would be enough to purchase our canals, and, when the key lines are held by railway companies as before indicated, that sum would also provide for the construction of new links of water-way, in lieu of the obstructed lines of junction. The construction of from thirty to forty miles of new canals would at once put in connexion the Thames, the Severn, the Nene, and the Trent. A return to former prosperity would at once commence. So certain is this, that we do not doubt that it will be before long taken in hand. But what we are anxious to see cared for, is not the canal interest (except as a means to an end), but the productive interest. We want to see the canals not only navigable, but free. The present is the moment at which to take this in hand. If the canal companies, aided as they will be by the Chambers of Commerce through the country, fight the battle high-handed, there will be the spoils of the victory. When dividends rise from 2½ to 25 per cent., there will be all the stronger disinclination on the part of the canal companies to part with a property of such enhanced value. It is now that the bargain is to be made. It could be made by the assent of the parties interested, instead of, as in the case of the railways, by compulsory purchase. Let a great central committee, with a large guarantee fund, be formed for the purpose of opening our inland navigation free for ever to the public. The success of such a body in removing the obstructions now caused by the railway companies might be delayed, but must be ultimately certain. The Railway Commission, if the recommendations of Mr. Ashley's committee be carried out, will have power to enforce it. There will be the alternative of the new canal lines, if the contest be unduly obstinate. But as a part of the bargain, let the canal owners fix *now* the price at which they will sell the property. The influx of traffic will be certain to provide the means of purchase, on the behalf of the committee, for the purpose of free navigation. But if the bargain be deferred till the canals are actually open, the nation will have to pay five times as much to obtain the permanent freedom of its water-ways as would now be joyfully accepted by the proprietors of our canals.

The main question between ourselves and those railway managers and advocates who have come forward in defence of the present system, including low mineral freightage, and low rates wherever sea passage competes with railway passage, lies in a nutshell. They say, a little profit is better than none. We say, that entirely depends on what is the preliminary expenditure incurred for the purpose of securing this little profit. Take a line which has cost 26,000*l.* a mile, and which has a gross traffic in passengers and goods of 2,900*l.* per mile per annum. Such was the case of the French railways in 1877. Bring upon that line an extra traffic of 800*l.* per mile, earning a net sum of only 80*l.* per annum. It cannot be done if it consists of a traffic running at a much slower rate than the existing traffic. The passenger and goods traffic, no doubt, might be increased by 800*l.* per mile per annum, earning 400*l.* per mile net profit, to the manifest advantage of the proprietors. But that is not the question. The question is the introduction of another kind of traffic, conveyed under different conditions, and earning a low return. This can only be done, either by driving off a part of the existing traffic, paying its 50 per cent., or by increasing the accommodation and the capital cost of the line. This latter course we have taken. In 1877 our passenger and mineral earnings were just 2,900*l.* per mile per annum. But we carried besides this 800*l.* of slow mineral traffic. And what was the result? Perhaps,—it is not sure,—we carried 80*l.* per mile net profit more. But it is certain that our railways cost 39,500*l.* a mile instead of 26,000*l.* per mile. That is an indisputable fact. Is there any rational doubt as to its real import?

The growth of railway capital has long been made a subject of complaint and of alarm by many writers. The subject should be looked at with proper discrimination; a growth of capital that brings with it an increased volume of paying traffic, and an increased percentage on the same, as in the case of the French railways, is a growth of both public and private wealth. A growth of capital to the amount of 20 per cent. in cost per mile in nine years, accompanied by a decline in net earning power of capital from 5·56 to 4·67 per cent., which has taken place on the aggregate of seven of the great English trunk lines, is a loss of property, public and private. Any compulsory transfer of railway property would increase the capital (or the annual dividend) by at least 16 per cent., or to 856,000,000*l.* up to the end of 1881. But any operation, involving the transfer of perhaps 20,000,000*l.* of property, that tended to provide England with free inland waterways, would not only allow of the transport of minerals and heavy goods at cost price,—which it is the true point to secure,—but, by arresting the unprofitable growth of railway capital, would afford the only hope that is conceivable of a future reduction of fares and freights. To open our canals will be to cheapen railway transport, as well as to provide means of transport with which railways only compete to their own disastrous loss.

THE SELECTED DESIGN FOR THE GERMAN IMPERIAL PARLIAMENT HOUSE.

THE design of Herr Paul Wallot has been selected by the almost unanimous vote of the jury from among those of 189 competitors, who sent in upwards of 2,000 sheets of drawings. Such is the information as to the result of this great competition which has already been recorded in the *Builder*; there also it has been read that the best German critics agree that in point of originality of character the design of Herr Wallot surpasses all that were placed in competition with it, and that the whole evinced satisfactory national progress since a previous contest in 1872. If the Germans themselves are satisfied, what other nationalities, it may be said, are so far concerned in the matter as to have a right to complain? Perhaps we may reply, most other nationalities, if there is reason for complaint at all. A structure which must needs be imposing by combined magnitude and dignity of purpose in the imperial city of United Germany is an object which will attract the attention and interest of all students and lovers of art, who will always be drawn sooner or later to Berlin by the accumulated treasures of the national museums. It is by no means matter of indifference to such visitors whether a prominent work of architecture which cannot be escaped from is a constant cause of irritation, an offensive obtrusion, or as constant a source of delight. It is a still more serious consideration whether the success in competition of a faulty design may not blind to its demerits in too many cases, and misdirect emulation in other instances, even when it does not vitiate taste. We cannot conceal from ourselves that the authority of success has an influence which is constantly independent of any particularly cautious appreciation or analysis of its conditions. It marks the direction of fashion, at least, if not of good taste; and if good taste will ever survive in the long run, the shorter period of an individual career may seem more prudentially adjusted to the shorter career of even whims of which the vogue will last its time. The services of Germany to science, to learning, to at least the archæology of the arts, have been so pre-eminent that it becomes a duty to be jealously watchful lest a not very unnatural assumption of consequent superiority in the practice of the arts should be admitted with the tameness which, we believe, has ascribed too liberal a value to German criticism, not only in the arts, but in literature, ancient and modern.

These observations will not read like an introduction to a very highly-pitched note of appreciation of the design which is at present in question; nor are they meant to be such. Sooth to say, with every desire to welcome a great achievement,—"Trojan or Tyrian,"—with an earnest anxiety, indeed, for an opportunity to greet with disinterested applause the successful improvement of still one more of the great national opportunities that within a generation can scarcely count up beyond the place of units, this accepted design for a structure which should be the symbol of some of the mightiest aspirations, — of the progressive achievements of our time,—seems (must the word be said?) unsatisfactory in the last degree; crude and commonplace when it does not deviate into originality to become hopelessly incongruous.

It is, perhaps, right that it should be understood that the present enunciation is purely from the point of view of the architectural critic,—of the devotee of admirable architecture,—so far, at least, a representative of the most numerous class whom architecture concerns. As regards the distribution and assignment of apartments on the chief floor for particular purposes, various apparent anomalies have already received notice; some of these may have their justification in peculiar national habits, and others are open to easy correction, and may be expected to receive it. The separation of reading and writing rooms from the library at the greatest distance possible from each other, appears strange; and scarcely less so the remoteness of the *restaurant* from the hall of session and cloak-rooms for the sake of interpolation between the two most spacious

committee-rooms. Its position also as ranging with the Hall of Session, Ceremonial Hall, grand staircase, and state entrance upon the transverse axis of the plan, and occupying the very centre of the chief front on the principal floor, is a little suggestive of bathos. Full allowance, however, must doubtless be made for the conditions imposed by the form and limitation of the area at command, and criticism must be content to attach to particulars in respect to which the architect could exercise unshackled judgment and taste.

We are scarcely in the position to form a definite opinion respecting what should naturally be the principal aspect of the building from comparison of the plan with the elevation from the point of view provided. The western front, which is not shown, should be the true façade, though the eastern, of like magnificent extent, has also a claim to be treated with special if subordinate dignity. Central on the west, and facing the site of the future Imperial palace, is the entrance of state, which admits to the grand staircase, and thence on the transverse axis of the building to the Hall of Ceremony and galleries of the Hall of Session. The predominant importance of this axis is manifestly emphasised by the cupola over the Sessions Hall, and then by two other ornamental erections surmounted by colossal sculpture, the least and lowest being central. It is very difficult to understand how these could tell effectually, even at an oblique view from the front,—how they could compose harmoniously with each other, and then with the violently-contrasted square towers at the angles. In what manner appropriate dignity is given to the main entrance, opposite to the palace, and blended with exceptional treatment of the windows which light the *restaurant* above it, is not to be deduced from the materials before us.

As regards the general design, a degree of solidity is given to it by the continuous lines of the basement, only broken by the interruption of carriage-entrances, and this expression is strengthened by the continuous bands between the two lower stories and the channelled masonry of both. But we must demur most strongly to the meanness of the square windows of the ground-floor, which seem utterly inadequate to light the wide intervals between them, and to be not only confined but crushed. They give offence, or, rather, perhaps, challenge pity in the curtain between the towers; but what shall be said of the suggestion of cellar-like obscurity within, which is intimated by the single opening of these distressing proportions in the full breadth of the angle towers, which are indulged above with exaggerated provision for illumination?

The long eastern front of the building has a projecting centre equal to half its entire length; it is marked sufficiently as not being the true or principal façade by the absence of a central gateway or entrance, in which respect, indeed, it is marked, intentionally or not, as subordinated to the composition of the two ends. In perfect consistency with the internal arrangements two large and co-ordinate portals indicate provision for admission of the outer world in two distinct streams to communicate with diverse classes of the necessarily multifarious offices. We are therefore plainly at the back of the building, and only at the back could the dead flank walls of a projecting centre be otherwise than repugnant to our sensibilities. And yet does this projecting centre receive such exceptional treatment as to imply an anxiety and an endeavour to mark it with distinguished emphasis. The line of general cornice of the building is broken for once to introduce columns flanking a large window opening, rising as high as its corona, and sustaining an independent entablature and thereon a pediment. This feature,—a pedimental form,—unknown on other sides of the building, is introduced again over the window below, and also over each of the side portals. Variety, at least, is proffered to us by segmental pediments attached to the *quasi*-cupola above, which comes most closely into composition with this front. Finally, at each angle of the plan of this cupola rise piers of channelled masonry, which certainly claim kindred in distribution with the great angle towers, but they are surmounted by pinnacles or pyramidions or obelisks, which neither in function nor outline manifest analogy to any other feature whatever in the entire building.

The general cornice which, but for one surprising interruption, seems to run entirely round the building, does its very best, and certainly contributes importantly to promote a semblance of true structural coherence, but not without provocation of a protest. It shows consistent relation to the lofty windows of the towers and intermediate centre as expressing a well-proportioned height of the apartments so liberally lighted; but as it is continued it throws us upon a perplexing doubt as to what can be the interior application of the dead interval above the smaller windows which far more than equals them in height. Does it really represent the height given to the rooms between top of window and ceiling? If so, they will be of very anomalous proportions indeed. If this incongruity is avoided, how else is the space disposed of? Let it be disposed of as usefully and ingeniously as it may, the offence to the spectator from without remains the same; the design fails to explain itself to him lucidly and satisfactorily. This is an aggravation of a general failure in harmony of composition or something more,—of a violent breach of that well-ordered gradation which is as essential to dignity as to grace,—most of all indispensable when, as in the present case, the requirement is for dignity to assert itself under the conditions of gracefulness and sympathetic combination.

Free columns will always dominate pilasters with which they range, but surely they might be more happily introduced than as we see them on either side of the large windows of the angle towers, raised upon advanced rustic piers, then mounted on pedestals and surmounted by a segment of entablature, and owing an excuse for their existence after all to a statue at top, some 70 ft. above the eye.

The side fronts of the building, so to call them, on its longer axis, are treated so similarly, and in themselves so symmetrically, as to present themselves as proper fronts composed of centre and uniform wings; they give, in consequence, no intimation whether the true front of the great structure is to be sought to the right of the spectator or the left, or whether, indeed, the true front may not be already before him.

The wide and lofty windows of the towers at the angles range and correspond in proportions with those of the central division of the intermediate curtain over the gateway, an agreement which inevitably suggests a certain correlation,—but a suggestion that is as immediately baulked. The quoins and channelled courses of the towers which are continued from the basement to the general cornice give an appearance of a solidity which is not greater than demanded by the extraordinary superstructure, but which oppresses and threatens to reduce to triviality the intermediate screen,—the central compartment included.

The four smaller windows on either side of this are in such sudden contrast in respect of size, that, whatever their sufficient absolute dimensions, they seem only worthy to light passages of communication between such apartments as the three great windows imply,—apartments which, it must be said, even so present an appearance of unsocial isolation. When we refer to the plan of the chief story, we find that the two small windows to right and left of the centre do, in fact, belong to the apartment which is lighted by the large window, and the suppression of any intimation of that fact on the exterior seems gratuitous sacrifice of an opportunity for expressive composition. On the north front three of the four windows on either side combine with the large central window to light the library, but apparently their treatment is the same as on the south.

It cannot be said that the range of smaller windows possesses any dignity that would be materially affected by reduction of multitude. Each series of four has an allowance of only three pilasters, with the result that a terminal window at either end seems crowded into its corner against the angle of a returned wall to the great impediment,—real or apparent, it matters little,—of its function of illumination. The omission of a pilaster also in this position,—the open avowal that it may be dispensed with,—conveys an imputation on the member of worthlessness, if we should not say, is a simple confession of fictitiousness in its employment throughout. It is but rarely, indeed, that the pilaster is employed, or capable of being employed, externally with true artistic effect, and of all its forms the pilaster on a pedestal is surely the most obnoxious. A pedestal so employed is the high-heeled shoe of architecture; as derived from the most unlucky innovations of the Roman architects, it pairs off with their broken architraves, which we shall meet with here also before we have gone far. An isolated pedestal has inevitably the appearance of coming to the assistance of a short column that would have done without it if it could. It is interesting to observe in the churches at Cologne, and on the Rhine generally, how the better taste of the Romanesque architects dealt with these sophistications before handing them on for still further modification by the masters of proper Gothic. It is not difficult to trace, by comparison of examples, how a set of mouldings which seem to constitute a super-abacus are, in fact, the remnants of the all but suppressed segment of the Roman entablature. The pedestal is less drastically dealt with, but no less effectively; it is unceremoniously shorn of its cornice, and instead of being admitted as a contrivance to eke out or lift up a column, it is made part of it,—is taken into its proportions and finished with base mouldings, which happily repeat those of the proper base on another scale. The transformed pedestal is thus, as the evolutionists would say, *differentiated* to constitute a fully-developed base, which is peculiarly effective as the dignified support of a cluster of columns or a compound pier.

So little, then, does this design appear to us to be worthy of a noble,—it may be said a secular,—opportunity, that we should be unwilling to accept it as the best that the contemporary German architect is capable of; we would willingly ascribe its selection rather to a previous error in the selection of a committee of judges. Opinions with which we have nothing to do here are at variance as to the position and the promise of the constitutional system of which a German Imperial Parliament house is a natural symbol,—whether it is already in the vigour of youth or scarcely beyond the precarious stage of a hopeful but still imperilled germ. But there can be no difference of opinion as to the momentous historical importance of the events which have culminated in the requirement, to whatever ultimate end, of a seat of concentrated legislation for Germany. It is not, however, as a monumental reminder of the proceedings and sacrifices and achievements by which the union of Germany was brought about that their Parliament House will ever appeal to Germans; far more reverentially will it be regarded as the sacred hearth of those aspirations and energies which realise, by due adjustment of self-assertion and self-control, "the act of order in a peopled kingdom." It is, no doubt, much to demand of an architect that in his conceptions for a work prescribed he should not merely bear in mind the past and present, but even anticipate history, and so provide a structure which shall appear to future generations to have been designed under a consciousness of the diversity yet consistency, the detail yet comprehensiveness, the intellectual vigour, and the moral dignity of the work that was to be carrried on to happy completion within it; and yet it is possible in architecture, as in other arts, for "old experience to attain to something like prophetic vein." Reluctantly, we must confess that our hope for the harmonious consolidation of Germany by Parliamentary action would be but weak if the design before us is to be accepted in any degree as a worthy symbolical embodiment of the self-consistent energy and harmony to be expected from it.

The Lime Process of Getting Coal.—At a monthly meeting of the South Staffordshire Institute of mining Engineers, held at Dudley, on the 5th inst., Mr. W. Farnworth, who presided, explained that the Council of the Institute had been that day to Cannock Chase and witnessed some experiments with the new lime process of getting coal. Mr. Sopwith, of the Cannock Chase Colliery, said the men in the employ of the patentee had been down the pit, and had offered to them the shallow seam to experiment upon. They chose a fair specimen, and, without going into details, he might say that after the lime cartridges had been put in, and the expansion had taken place, some 40 or 50 tons had come down in a solid block. So far as he was able then to say, the trials had been as successful as could be desired. The cost of drilling, &c., would have to be carefully worked out in reference to gunpowder. The coal came down so quietly that the only slack to be made would be that in breaking up the coal for the tubs.

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FURTHER MUSINGS ON THE MERITS OF SOME STYLES OF ARCHITECTURE.

FINDING it impracticable within the limits of one evening to say at the recent meeting of the Architectural Association all that was wished on the above subject, and having in consequence left out some matter which I had written and intended to then bring forward, I have been tempted to supply the following additional observations in your journal.*

Before proceeding with the consideration of any individual style, let me say a few words generally. Mediæval architecture has such a wonderful versatility, that it is difficult to trace to the end the many ramifications into which the several European styles spread in the Middle Ages. To instance only one of its leading features,—groining, the outcome of the parent,—the plain, ribless, quadripartite Roman vault, a form of construction which was carried on into the Anglo-Norman,—this alone is remarkable to contemplate. The children of its maturity may be called the ribbed quadri-partite and sex-partite vaults, and, ultimately, the intricate liernes of the Late Decorated period, culminating (as far as mere elaboration went) in the magnificent fan-vaulting of Henry VII. In the South of France the early barrel and domical vaulting, though thoroughly harmonising with the architectural surroundings, lacked the finish of the late developments.

In Italian architecture there is much variety in the surface of the vaulting, whether in relief or colour, as, for example, in the celebrated stanze of Raffaelle in the Loggia of the Vatican. But, short of the domical and barrel forms, there is not much else to choose from.

Turning to the Gothic treatment of vaulting, there is the indescribable charm of the play of light and shadow, caused by the various sharply-expressed angles of the groining. The style can be most legitimately treated with such freedom as to suit every want, and to adapt itself to circumstances. In another feature the mutability of Mediæval architecture is found,—in wall arcades, sometimes one behind another, sometimes trefoil-cusped, sometimes cinquefoil-cusped, or in other examples with plain well-moulded arches, or in arches of ornamentally-curved forms, practically in one order, but not cusped, as at Durham, Wells, &c.

Or, again, in a window, doorway, a capping to a tower, or a wall diaper, observe the large number of changes each of these features undergoes. It is not only a variation in surface ornament, or a little alteration in the mouldings, but is equally shown in outline, form, and construction.

Mere caprice or eccentricity I except. The Mediæval men were too faithful to the true principles underlying all that wondrous manipulation of the vernacular architecture, as I may truly call it, to often diverge into such paths. And this versatility extends through those great English Mediæval styles which may broadly be called the Early English, Decorated, and Perpendicular, though the latter of these three has more sameness than the architecture of the two earlier periods.

In the timber roofs is another great charm of the Gothic era; first, the rude tie-beam construction, then the trussed rafters, the king-post, the magnificent hammer-beam treatment, or the moulded and cambered tie-beams with rich perforated panelling over, or the cradle ceilings of Somerset and Devon. I cannot but just mention a few other details in which a like beautiful variety exists: the fonts and pulpits, for example, particularly noticeable in the former, of which so many interesting specimens have fortunately been handed down to us, after having been the appointed means of inducting so many babes into the Christian fold; or in the tabernacle work of shrines, tombs, and niches; in canopies to stalls; in the plan of piers; in that beautiful Gothic feature, the flying buttress, with its useful as well as elegant pinnacles; the carved spurs in Norman and Transitional bases; the crocket and finial exquisitely carved; the gable crosses, the barge-boards, the pierced parapets of many a different design, the corbel tables, the brick moulded chimney-shafts. All these features present to us many beautiful changes, but yet do not represent a tithe of the wealth of resource in Mediæval work.

In the smaller, though none the less important, details, such as, in churches, the sedilia, the aumbry, the credence, the piscina, it is rare to see one like another. In our modern work, probably owing to less time being bestowed on it, there is much more sameness.

Although, as that sagacious authority, Mrs. Malaprop, has remarked, "Comparisons are odorous," I cannot resist jotting down some few notes on the idiosyncrasies of Classic architecture. I have not yet mentioned window tracery in the foregoing remarks on Mediæval architecture, undoubtedly one of the finest characteristics of its best period, where the Italian style is notoriously at a disadvantage. But, of course, in the Veneto-Italian style, to be presently noticed, some of the palaces exhibit the yearning after this lovely feature, which, however, never developed further than the simple principle of two semicircular-headed lights under a semicircular arched window carrying a circle. The Piccadilly front of the Museum of Economic Geology is a good example of this; in fact, the whole building is an illustration of chaste Veneto-Italian design, severe possibly to a fault, but how superior to much of the bastard stuff foisted on the public (who, I fear, like it only too well) nowadays as "Free Classic," of which the reputed mother, which produced a Michelangelo, a Palladio, a Scamozzi, would have felt ashamed!

There is an elegant feature in Italian architecture, if skilfully treated, — the Venetian window. But supposing the same idea were attempted to be carried out in a Gothic mullioned window, the effect could scarcely be satisfactory,—that is to say, in Domestic work. In fact, I hardly remember a Mediæval example where the centre light is wider than the others, though in ecclesiastical architecture, in the case of traceried windows, it is not so unusual, and is sometimes of advantage for the working in of the tracery design of the head.

In the more severe phases of Italian work there is not much variety in the balustrades. There seem to be about three species:—(1), the ordinary bulbous form; (2), the double-bellied baluster; (3), the baluster square on plan, though bulbous in elevation. But in Renaissance work a little more play of fancy in this particular respect is found. There are miniature pilasters in the place of balusters, or geometrical devices consisting of circles, lozenges, frets, &c.; but, like window tracery, the mutations are very limited as compared with those of the great Gothic field. The rustication of the basement or lower stories of a building is one of those details of Classic architecture for which we search in vain among Mediæval examples,—it does not seem to exist, the parallel is wanting. The courses of masonry may be deeper, the surface less finished, the reveals of windows and doorways more profound, the openings narrower and smaller, the mouldings plainer,—in a word, the whole construction more massive. But in other respects the distinction of treatment between the lower and upper portions is not so great.

There is one detail in the later developments of Italian architecture in which it is difficult to see any force or any object,—far less beauty. I mean the box-like blocks of stone, sometimes vermiculated, "hung," so to speak, round detached columns. To a man who reverences Mediæval architecture the notion is given of the work being half done and left unfinished, or as if a square block, called in the euphemistic language of Chambers "a rustic cincture," had had a round hole cut in it, and the attempt made to slide it over the cylinder, but with so little effect that it stuck half way. How it ever can have been considered a recognised and legitimate feature in the style seems a puzzle. The Gothic zone or band has, in this respect, a great superiority. In Italian and Gothic architecture it is remarkable how very different in proportion are the columns. In the more severe Italian their height is "cut and dried," and it is only in the Renaissance and Elizabethan times that less rigour came to be observed. Consequently, bands or zones were never actually required, though sometimes added, and then the length of the column beneath them fluted, or decorated with sculpture. But it is not my intention to traverse the whole ground of Classic detail, and I must briefly conclude this branch of the subject. There is a certain coldness and stateliness in Italian architecture which seems naturally to appertain to its symmetrical order of things. Whereas Mediæval work is warmer, less formal, on account of its not infrequent irregularity, though when occasion demands it, it can, as we know, don very stately robes, and be a match to its severe elder sister. Mediæval architecture is home-like, as may be well illustrated by studying the effect of a labourer's cottage carried out in this style. In Italian architecture it is difficult to conceive any building less humble than the entrance-lodge to some gentleman's park.

The many beauties of the Italian-Gothic style have been ably treated of in the "Brick and Marble Architecture of North Italy," as well as in Ruskin's well-known works. Yet, happily, there still remains much that might be said about that style. Among its conspicuous merits I may certainly instance the natural treatment of terra-cotta and brickwork; the extensive use of various beautiful native marbles in decorative features; and last, not least, the glorious enrichments in mosaic and fresco. The employment of alternate bands of warm-tinted stone and brick, and a like treatment continued in arch voussoirs, gives much variety of tone and colour to Italian-Gothic work, having a special charm to the traveller from a less sunny land. So, when the passion for this style was raging a few years back, this characteristic of North Italian was translated, only too frequently with but indifferent success. For the colours of the two materials ought, to a great extent, to be assimilated and so brought into harmony, and thus prevent a "bizarre" look. In these Mediæval examples, too, the gentle hand of Time has done much to bring into tone the diverse tints, not only in Italy but in many other countries. If a creamy yellowish-looking stone is used, with a good deep red brick (not bright red), the effect is good and harmonious. The contrast must not be only in one place, but spread over a large area, so as to give "breadth of effect" and avoid "spottiness." It is unfortunate the English language does not contain better words to express what is meant in this respect, so I have no resource but to explain myself by the usual cant phraseology.

The same principle prevailed in Italy as existed in our Late Perpendicular period, where large surfaces are monotonously, whilst ornamentally, panelled. Yet this great repetition of panelling actually looked less fussy than in other buildings, where there was abundance of plain wall surface, but no judicious manner of utilising it. While on the subject of panelling as a means to sometimes break up and greatly enrich a plain surface of wall (a thing often desirable, as at the east end of a church), I would instance, as very suggestive, the effective treatment that exists in the apse of the Duomo, and also at San Fermo, Verona. In this case diaper-work would have been too rich, and the long narrow pilasters of shallow projection which occur are scarcely further apart than the width of each pilaster. These support semicircular arches, but it is almost needless to say that the pointed arch is as equally applicable as the round for such features. There is a beautiful object in North Italian Gothic work which does not exist in old English architecture, the stone balcony supported on boldly-moulded corbels or cantilevers. The balcony exists in many modern Gothic examples, as in the new buildings, Christchurch, Oxford, the style of which, however, is decidedly very suggestive of Italian Gothic. It is difficult to understand why, in Mediæval times, the balcony was not adopted. Though our climate is unfavourable for sitting or standing out of doors for any length of time, there are yet days when it would be a pleasure to thus make use of a balcony, especially to those who like a whiff of the fragrant weed. At any rate, flowers or shrubs, with an æsthetic blue pot or two, could be put here with excellent effect, both pictorially and architecturally. When the sun shines an agreeable shadow would be cast, giving a sparkle and crispness of effect to the elevation or façade, preventing any appearance of tameness or flatness. It is easy to guard against undue shadow to the windows beneath by making them rather larger, or, perhaps, by obtaining a greater amount of light in other walls. Such an adjunct suggested by North Italian architecture could be very suitably made use of without any misgivings.

The Certosa, near Pavia, is one of those buildings which an architectural purist might, in cold blood, condemn, if he only judged of it from illustrations. But let him see the wonderful façade and general *ensemble* under a deep blue Italian sky, with all the beautiful variety of different coloured marbles, delicate arabesques, and decorative sculpture.* What, then,

* See vol. xlii., pp. 510 and 559.

* See view published in the *Builder*, p. 208, *ante*.

becomes of his strictures? Judging from my own experience, I can speak feelingly, and opine that one's condemnation is very prone to vanish! Nevertheless, it cannot be denied that a cardinal rule of true composition has been transgressed in the principal façade, where the lower stages are more ornamental than the upper. The Englishman, accustomed to the greater ruggedness of our Northern architecture, and finding the surroundings of the Southern clime so different, is very apt to treat as a matter of course this and other divergences from the rules laid down as proper in architecture, forgetting that such axioms are equally applicable in every country, and that it is dangerous to give way to licence. History is said to repeat itself, and one of the worst blemishes in Italian Gothic is continually now being introduced in another very different but, alas! debased style, the so-called "Queen Anne." I allude to the way in which architectural features, whether constructional or ornamental, are stuck on to a building, instead of being bonded into it. Late Pependicular work was bad enough in this respect, as can sometimes be seen even in counties like Somerset, where splendid building stone was to be had almost at the door. But in those localities where freestone was scarce, there is, but too often, hardly any bond at all, and a width of only 2 in. or 3 in. at most between the termination of the mouldings and the end of the face of the stone. In the Perpendicular period, however, the further enormity, now so common in the "Free Classic" style, of projecting architraves and other members attached to a building just like joiner's work, was rarely perpetrated.

The use of coupled shafts is not peculiar to North Italy, but is, perhaps, a more characteristic feature there than in any other country. There are two modes in which they are arranged, *i.e.*, either side by side, their axis parallel with the face of the wall; or with the axis at right angles with the thickness of the wall. The west façade of San Zenone, Verona, contains, in the curious "wheel-of-fortune" window, a good specimen of the first named treatment. It appears to me that in those instances where a substantial wall is desired, and the walls, perhaps, are thin, owing to want of funds, the former treatment answers well, and takes away any semblance of poverty-stricken architecture.

In the interesting Church of Santa Eufemia, Pavia, there is a pretty though not very common feature, that of the shafts set at the angles of the octagon turret or tower, which in effect help to carry the corbel course, thus pleasingly and most appropriately connecting it with the substructure. The shafts in this instance project, the rest of the turret wall between each shaft constituting the panels, as at San Gottardo, Milan. In the latter instance, however, column rests on column, but there are corbels between the upper range. The columns in the second range (counting from the top) rest on a set-off. The angle shafts are detached, but need not necessarily have been so.

Another very characteristic North Italian, as well as German Romanesque, feature is, of course, the arcade following the rake of the gable. In Milan and its neighbourhood, it is a feature of the tile-covered spires to be elongated cones, or circular in plan. From a practical point of view, this has the advantage of having no angles, or weak points for rain to get in; but, on the other hand, the octagonal spire, or the square-planned pyramidal capping, has much more vigour, and certainly better suits our climate. How fortunate that during the rage for Italian Gothic architecture, no enthusiast ever thought of transporting this to our country!

There is a peculiar detail in this same style of architecture which also, curiously enough, exists in another very different country,—Ireland,—the return of the jamb mouldings round the window-cill: an irresistible reminder, as it appears to me, of an Italian (Classic) door or window panel. For many reasons it is advantageous to have a deeply-splayed, or at least a flat-weathered, cill, to throw off the wet, something which shall not harbour dust, or water to be frozen up,—something firm and substantial, on which the jamb mouldings can plant themselves. There is yet another advantage in the plain splay,—the pretty way in which the mouldings die into it, and elongate their sections,—a feature which is also effective in jambs where the arch-mould stops on it in what is termed a "discontinuous" manner.

In concluding this short review of this particular style, I must not forget to mention the remarkable intarsia woodwork of the latter part of the fifteenth century, which is of great beauty. There really seems no reason why such a species of ornamentation should not be more used in England, as has been essayed with much success by the late Mr. Burges in Worcester College Chapel, Oxford. But great care must be taken not to introduce this particoloured ornamentation into a building where the walls are left uncoloured, the roof or ceiling undecorated. In such case the inlaid woods would appear out of place, out of harmony and tone with the surroundings. I believe that the variety of different colours in Tunbridge ware is from the tints of various naturally-coloured woods found in that neighbourhood. Owing, however, to their generally being squares, the effect has neither the variety of mosaic tesseræ, with their irregular cubes and thick joints of cement, nor that of the intarsia work of North Italy, where the inlay is in all varieties of curved, straight, or other forms, and of every size.

Since the use of distemper, mosaic, or tiles has become so usual in England, while the ceilings are coloured by artistic hands, and while Roman mosaic or handsome encaustic tile pavements cover floors, why should we be content with only oak or walnut fittings,—I speak more particularly of churches?

By no means let the characteristic features of well-moulded bench-ends, &c., be abandoned. Let them remain so, with the addition of employing different coloured woods, or inlay, as the case may be. Such examples exist among us, but might, I venture to think, become more common.

The last style which I propose to treat of may be said to be almost the mother of Gothic architecture. In the East, where the sun rises, and where true believers consider the very earliest historical memories spring, from near the garden of Eden, from the East, appears to have sprung the germ of that grand style which, apparently founding itself on Classic models, stayed not there, but went to an earlier source, and with such nurture produced the magnificent and never-to-be-eclipsed works of the Middle Ages.

Fergusson* has drawn attention to the remarkable Gothic feeling of some of the work in Hindostan, which he attributes to the fact of the natives, some time after the Mahometan conquest, imitating the architecture of their conquerors. Few architects, however, have been able to travel there and investigate the matter for themselves, and their judgment has probably been formed by having seen some of the fine photographs published by the Government, or by other illustrations. There is, however, a very good substitute for a journey to India, and that is a journey to South Kensington, to the India Museum. The magnificent and extensive collection there is apparently not so much frequented as its very interesting contents deserve. At present the unpromising makeshift appearance of the exterior rather deters people from going in; and when one enters at the so-called principal entrance, such a series of tortuous passages, some almost underground, and so many twists-about, make a visit to the collection a tiring one, as the objects to be looked at are so far away to reach. No doubt, in time, when some grand building springs up to shelter it, the public will find out the Museum more easily. Casts, though not giving the time-worn colour and texture of the original details, have yet the merit of affording an absolutely faithful reproduction of the contour of the actual work. A drawing may not be truthful; a photograph, owing to the particular light or focus in which the view was taken, may not exactly give a right impression; and in either a photograph or drawing, *scale*, with the exact relief, cannot be represented. Casts have none of these disadvantages, and both in the Architectural Court at the South Kensington Museum and at the India Museum they exhibit exact copies of some of the largest details. The "bracket" capital, which is considered to be of a very early period, far before the development of the generally-recognised capital, is a great feature in Hindoo architecture. There are some good specimens of it in this Museum. A large part of the ornamentation is barbarous and overlaid, with scarcely an inch of plain flat surface, so that much is frittered away in crowded detail, giving the tired eye no rest. A characteristic specimen of this kind of thing exists in the magnificent entrance archway to the great tope at Sanchi. There is no attempt, apparently, at any real architectural composition, but only an array of superimposed detail, in which, by-the-bye, the relatives of Jumbo figure very largely in all kinds of attitudes, the elephant being in the East one of the most important animals for many purposes, whether for regal state or other uses. On the other hand, as has been not infrequently remarked, how much exquisite refinement and delicacy is found in this Indian architecture and sculpture! The ornamentation of the Runic, the Romanesque, and the Norman is foreshadowed when we examine some specimens from the Amburath Temple, for example. Of the latter type there are some very beautiful examples in the temples at Bhuvanesvara (commencing with the seventh century A.D.) of ornament designed in a serpentine manner, teeming with animals and birds. In fact, in these temples there is much most worthy of attention, if one can form an opinion from these excellent casts. In the ruined city of Saitu is some foliated ornament (of about A.D. 1100) which is quite Renaissance in character, while some of its detail more resembles Flamboyant work. In specimens of Hindoo architecture of the tenth century, the characteristic ornament of our English Decorated style, the four-leaved flower, occurs most unmistakably; and in examples of the eighth century, the Tudor rose, four-leaved or petalled, has been anticipated. One wonders how it came to pass that, while the ornamentation is frequently barbarous and rude, there is never any vulgarity. I suppose the best reply is that the Oriental imagination had an innate spirit of greater refinement in architecture or art than that of the inhabitants of Europe. The female figure, always draped, is very frequent in these Indian sculptures, posed in attitudes which are apparently meant to be very attractive.

At the ruined city of Saitron Rajpootana is a freely-treated example of an ornamental arch, sept-foil cusped, of about 1100 A.D. Fergusson, I may say, remarks on the trefoil arch in Hindostan, and appears to think it was indigenous, not copied from elsewhere. There are also some casts from the Amburath Temple, Bombay, which are extremely Mediæval-looking,—a patera or boss, for example. In the architecture of Cashmere there is a strong Greek feeling, so that we seem to find characteristics of many styles in India. The magnificent topes and tombs of Indian potentates are proverbially famous. As happens in hot climates, where water is so grateful and precious, much attention was paid to conduits, wells, and baths. There is an extraordinary model in the India Museum, to a large scale, of the grand staircase, or rather series of flights of steps, leading down to a well, which is quite a magnificent architectural feature, most unlike anything existing in Europe. In pavements, the encaustic and glazed tiles are, in texture and general appearance, much like Mediæval ones, though in the general tone of colour green is more predominant, rather than red and buff.*

B. EDMUND FERREY.

* I shall have occasion more than once to refer to this great authority on Hindoo art, but will just premise that what I write was not suggested by Fergusson's work, but is merely the opinion of one who has not made this style a study. So I can only pretend to lightly skim over its surface. Indian architecture is certainly distinct and widely different from other styles.

PROGRESS OF THE MINOR ARTS IN ENGLAND.

WRITING upon the subject of the progress of the so-called minor arts in England of late years, Herr Zimmern, a German critic, gives, upon the whole, a very favourable report. He is more particularly struck with the changes that have been taking place in the style of fitting up of the ordinary sitting-rooms of English dwelling-houses. It is, he says, an undeniable fact that, within the past fifteen to twenty years, a lively interest has been awakened in this country in all the arts contributing to the adornment of our living-rooms. Upon this subject many books and treatises have been written, many lectures have been delivered, and numerous models published to the world within that period. The rooms of English dwelling-houses, almost without exception, show a total change, and on the whole it cannot be denied that their interior has been

* To be concluded.

considerably improved. Not so very long ago there was no room left for free choice in the character of our internal fittings and ornamentation, but now it is quite within our power to indulge our personal tastes, to carry out new practical idéas, and to gratify our desire for variety. The walls of our rooms are no longer, as formerly, pasted over their entire surface with one and the same pattern of paper. Who does not remember the unpleasant effect that used constantly to be produced by the repetition of the same glaring or tasteless wall-paper perpetually forcing itself upon the eye,—a pattern which had been known ever since paperhangings had come into existence, and which had to be endured from the difficulty of obtaining anything better? This, which was formerly a necessary evil, is so no longer. In England we have at length arrived at the conviction that wall-paper ought to be regarded simply as background. Hence we have softened its tones; we have made the figures upon it less distinct and less prominent, and we avoid the mistake of making the colours of the ground and of the figures different or inharmonious. Patterns with a white ground have almost disappeared, and dark-toned blue and green are more and more coming into vogue. But this is not all. A new arrangement is now made with the surfaces of walls,—they are divided into two divisions horizontally, and the lower portion is decorated differently from the upper. The original idea in this division appears to be that of the old panel,—that is, a protective covering for the lower parts of the wall by wood or some other material not easily injured,—and such, in fact, is the object the new arrangement is calculated to attain. For this purpose, matting of various patterns and colours, consisting of plaited straw or cocoa-nut fibre, is very popular. Another frequent material is pressed leather and various imitations of it. If these imitations only prove durable, they may be regarded as perfectly adapted to their purpose. If they turn out to be, not simply in appearance, but also in wear and quality, at all comparable to leather, they will be sure to gain ground. This material, which is a kind of oil-cloth, avoids the ordinary defects of oil-cloth, and is not covered with mosaic or carpet-like patterns of figures. It is produced in simple colours, quiet and pleasing to the eye, and deserves to be more generally used. However, with regard to the lower portion of room walls, it is commonly the fashion, although many artistic authorities place their veto upon the practice, to cover it only with paper of a pattern different from that on the upper half. It is still a matter of dispute whether such an imitation of a panel or dado in a dark tint does not offer a practical advantage, and whether, apart from this consideration, it is not artistically defensible on the ground that it serves to break the monotony of a large surface of wall. With regard to walls of small dimensions, however, it cannot be disputed that they would be better without any such break or division. Unfortunately, the builders and decorators of small houses are precisely those who are most inclined to a slavish imitation of the prevailing fashions, and so the panel-like divided walls are seen almost everywhere in small rooms.

With respect to the woodwork in the interior of houses, a considerable improvement is to be reported. Instead, as formerly, of endeavouring to impart to it a painfully-elaborated similarity to some more valuable kind of wood, woodwork is now either painted so as to harmonise with the wall-paper, or it is simply stained and varnished. The mouldings and surroundings of the fireplace are now almost always in wood, and in many houses are also painted or stained. The fashion of staining wood instead of painting it is gradually leading to the adoption of better kinds of wood, while formerly deal was exclusively used. The beauty of the natural grain of different kinds of timber is being more and more recognised. It is certainly a sign of progress that the practice is on the decrease of painting one kind of wood so as to resemble another, of making mortar look like marble and oil-cloth like mosaic work. Still the change is only going on so gradually that the observer, when he sees the odious old patterns constantly turning up again, often feels tempted to believe that their supposed decrease is only imaginary.

The custom of covering floors with fixed carpets, which was formerly universal in England, is now no longer invariable. The innovation, to which an exaggerated importance is attributed by the writer, as contributing to health and cleanliness, has, of course, necessitated greater attention being paid to the quality and appearance of the wood of floors. Carpets are now being employed of designs adapted to the apartment, and the English eye is becoming accustomed to the patterns prevailing in Oriental carpets. This improvement in taste is also producing its effect in the carpet factories of the country, and the harsh and glaring contrasts which once prevailed are giving way to more harmonious patterns and more appropriate combinations of colour. Although, as part of the wooden flooring is now allowed to be visible, more attention is paid to the timber employed, yet oaken and inlaid floorings are still rare. The ordinary deal planks, of course, look poor, and they are accordingly being stained, and inlaid work is being introduced, of elegant and durable workmanship.

The changes which have of late taken place with regard to fireplaces and mantelpieces are even greater than those in the floors and walls. Low square grates, a covering of glazed tiles, and a low simple fender, are now used in place of the old high round grates, with black or black-leaded sides and high fenders. The glazed tiles are in every way to be recommended. They are, or might be, pretty. They are easily cleansed, and they throw the heat back into the room. Like everything made by the hand of man, however, this form of decoration can easily be made ugly. Not a few of the so-called artistic tiles used in new houses might serve as examples of what ought to be avoided in this department. The low and simple fender is worthy of all praise, whether it consists of brasswork or of a stone border. The reintroduction of wood as the material for the chimney-piece has produced a sort of revolution in large houses. Artistic decorations, often models of the fifteenth and sixteenth centuries, are everywhere to be seen, and they are often of such dimensions as to reach many feet above the chimneypiece itself. Of course, the value of these productions is very various. Very recently they have begun to be overloaded with ornamentation, a fact that is not altogether satisfactory.

In the case of curtains and blinds, the same change of taste is making itself felt as we find in the carpets and paperhangings. The figures are less prominent, the tones of the colours are less glaring or definite. Pale green or brownish nuances have taken the place of white. This replacing of the glaring white by other and softer tones in the new fabrics is a characteristic mark of the change of taste in the decoration of rooms. The furniture in the English living-rooms that have been thus revolutionised likewise exhibits a different character. What is most noticeable in it is its greater simplicity, a larger variety, and a departure from the rigid symmetry of former days. The heavy table that used to occupy the middle of the room was first pushed to the side, and finally got rid of altogether. The return to old forms, and a suddenly awakened interest in the products of Japanese art, have resulted in producing an immense multiplicity in the forms of chairs and tables. Wooden chairs are now straight and square. Arm-chairs, or easy-chairs, are now formed of every conceivable shape. Basket work is increasingly patronised, and *chaises longues* and small work-tables and tea-tables are becoming more numerous. Instead of the unavoidable old chiffonier, elegant bookcases and cupboards are now to be found. In their chief lines they are mostly simple, but if, as frequently happens, they are imitations of Japanese original work, their two sides are often dissimilar. The panels are sometimes adorned with paintings, but the latter are subject to a modification or transformation, which is likewise attributable to Japanese influence. The idea hitherto prevailing in Europe of a regular pattern placed in the middle, which has been handed down to us, not from Greece, to which it is often attributed, but from the Byzantine style, which, of course, itself sprang originally from Greece, is diametrically opposed to the Japanese principle. The art of Japan shows an aversion to symmetry and repetition. For example, instead of decorating a plate or tea-cup with the traditional wreath of flowers round the edge, and with a single flower placed uniformly in the centre, it will ornament such articles with an irregular end of a twig or branch running across from the circumference on one side to the other, and suddenly breaking off at the boundary line. This new idea has been taken up with avidity, and there are few branches of English art in which its influence is not be traced. Fortunately it has not extended to the carpets and paperhangings, for, as these are naturally only background, figures of the kind we have described would be entirely out of place in them. Upon the whole, the Japanese influence has been most salutary, particularly from the fact that it has diminished the inclination to constant mechanical reproduction,—a tendency which has been fostered by the high estimation of symmetrical form, coupled with the development of machine work. Japanese taste, however, like Byzantine, has its dangers, and the English artist and art-workman, although subject to both influences, has not yet attained to the well-proportioned achievements of the Greeks, whose products observe the due mean between total disregard of all symmetry, on the one hand, and a mechanical uniformity on the other.

The cause of this interest in everything Japanese which has been awakened in England simultaneously with the revival of fashions prevalent here a century ago is to be found in the introduction of the Japanese wall-screens. This, perhaps, more than all the other changes, has contributed to give the new character to our dwellings. By help of a high movable screen we can produce numerous changes in the appearance of a room. The form of it, the light, and its fitting up may all be modified by a change in the position of the screen. The monotonous quadrangular form of most modern rooms is advantageously broken up by these intervening walls. They offer the charm of snug and cozy corners. Next to the banishment of the large central table that used to take up far too much space, nothing has so greatly contributed to render reception-rooms comfortable as the introduction of these wall-screens. Moreover, their own surface affords room for tasteful decoration, which in importance is hardly second to that of the room-walls themselves. In most cases the screen surface is made of some textile fabric, but sometimes of paper. Very recently the fields have been occasionally formed of wood-carvings in open-work designs. This latter species, which reminds us of Moorish wood and stone work, is often very effective in appearance, but the object of the screen to protect from the heat or draught cannot, of course, fail to suffer much under this style of ornamentation. For small screens, coloured glass has often been employed of late. With appropriate colours, like the deep blue of peacock feathers, which is mostly chosen, these screens look very well, but their weight tells against their general adoption. The prettiest, and at the same time in every way the most handy, screens are those consisting of a bamboo, cane, or some other light frame hung with Turkish silk. Few articles would, ten years ago, have filled an ordinary decorator with greater astonishment.

Considerable as has been the deviation from the old paths in regard to the furniture and fittings of our living-rooms, the new tendency is everywhere far more observable in the case of objects of a purely ornamental character. Pottery in particular has developed itself in England to a degree never yet attained in Germany. The Lambeth firm of Doulton has founded a new branch of this industry. In this pottery-ware articles of all degrees of quality are represented, from the commonest stone jugs to the finest and most splendid vases. The articles for which the firm in question are celebrated consist of a finely-glazed earthenware, whose ground colour is blue or brown, which in most cases is not uniform, but in various shades. This ground is ornamented either with figures incised, or in relief, and sometimes with a combination of both. The forms are exceptionally pure and classical, and the lines of the ornamentation are mostly worthy of the form. Amongst the most charming are the outlines of animals on a brown ground. As we hear, they are from the hand of Miss Barlow. The elevated ornamentation consists frequently of lines formed of fine pearls, which describe exceedingly pleasing arches and patterns. Sometimes the reliefs represent shells, flowers, or animals. Some of the larger articles decorated in this way remind one, though with important variations, of the strange Japanese vases only recently imported into England, upon which birds and flowers are represented in the strongest high relief with the most perfect fidelity. The art products of Messrs. Doulton are by no means limited to the earthenware articles bearing their name. Glazed tiles are

also manufactured at Lambeth, and some of them are very beautiful models. Paintings on porcelain and tombstones are also among their productions. The plates of the latter, painted by hand, are not up to the level of the other art products of the establishment. The generally high standard it has attained is in no small degree attributable to the influence of the Lambeth School of Art, where many of the artists employed by Messrs. Doulton were educated. This firm, on principle, allows the greatest practicable freedom to the individual taste of those who furnish the drawings, some of whom, like Miss Barlow and Mr. Tinworth, have acquired a well-deserved reputation of their own. Their terra-cotta tablets in high relief have for several years taken a place in the exhibitions of the Royal Academy. Terra cottas form an important branch of the manufacture carried on at Lambeth. The distinguished place held by these products of the potter's art is in the main due to the Doulton ware, and their most characteristic quality is their colour. Nevertheless, that which forms their strength, threatens also to constitute their weakness. The defects of the Doulton ware result simply from the tendency to overdo the ornamentation and colouring; that is, they arise from an absence of repose. All these objects, however, are marvellous examples of artistic skill; but as works of art those are the most admirable which are least marvellous or surprising.

Porcelain-painting has for a number of years past acquired in England the character of a fashionable amusement, and many ladies devote their leisure to it. It cannot yet be affirmed that the efforts of the *dilettanti* in porcelain-painting have produced many works of great artistic value, a fact which is probably attributable to the general ignorance of the fundamental principles of art prevailing amongst the ladies taking up this amusement. But where, as has been increasingly the case of late, this branch of art has been taken up by genuine students of art, the results have often been excellent, and articles have been produced which have been extensively purchased and have contributed to that improvement in porcelain-painting which is everywhere making itself felt.

The artistic products of the needle in England have likewise undergone a similar improvement. There is a special school for this branch at South Kensington, where the work of the ladies there engaged is constantly exhibited. Many of these samples will compare advantageously with the best of the older class of articles. In some cases the strict limits of art have been transgressed, but such instances are rare. The achievements of the special school for needlework show best upon screens and curtains, but it is beyond the field of an exhibition that they celebrate their greatest triumphs. This triumph arises from the fact that they have completely extirpated that barbaric kind of wool-working which was formerly the pride of English women. To the influence of this Institute we must attribute both an improvement in the material and in the colours employed in artistic embroidery. We also owe to it the preparation of copies of extraordinary design.

Another branch of ladies' work which has of late begun to be cultivated in England is the Gobelins painting. At first it aimed at copying the Gobelins work with the brush. But to copy at second hand the pictures after which the original Gobelins were executed appears a very unfavourable course of procedure. However, it has already been abandoned, and in place of copying the worked tapestry a sort of durable painting on rough fabrics for curtains, &c., has been substituted. Whether this young branch of art has a future before it, it is impossible as yet to predict. Such, then, are some of the fields in which art has in England made astonishing progress in recent years.

Building in Leyton and Leytonstone.—About three months ago we had occasion to complain of the bad building in this district. We are now informed that a great change has occurred, owing to the action taken by the Local Board and their surveyor. The Model By-laws of the Local Government Board, we are told by those who know, are being strictly carried out. All private connexions to sewers are now made by the Board's contractor, under efficient inspection. Certificates are granted on completion, and the building materials, with few exceptions, are of good quality.

FORTIFIED CHURCHES ON THE NORTHUMBRIAN BORDER.

ALONG the Northumbrian border, at intervals of a few miles' distance from each other, are several ancient churches that possess strong, stalwart stone towers, evidently intended for defence in Mediæval warfare, or as places of refuge for the inhabitants of the districts in which they are situated when alarmed by enemies. They are not always of the same date as the rest of the structures of which they form part; for, in some cases, they have been added after the rest of the fabrics have been in use for two or three centuries. Nor are they lofty, like landmarks; but low, square, sturdy, and inscrutable. There are also a few instances in which churches have been fortified in a similar manner in Cumberland, facing the same borderland, notably at Great Salkeld, Dearham, Newton Arlosh, and Burgh-by-Sands. The abbey church at Holme Cultram, also, in a plea for its maintenance in old times, was alleged to be the only place of defence for the inhabitants against the marauding Scots. The examples in Northumberland are more numerous.

One of the most interesting examples of a Northumbrian church thus constituted, "half-house of God, half-castle 'gainst the Scot," is at Ancroft. This village is about midway between "Norham's castled steep" and Holy Island. In the old days, when there was a monastery on Holy Island, Ancroft was one of the five chapelries on the mainland that belonged to that establishment, and which were served by priests appointed and paid by the priors. The little church has the same characteristics, in miniature, that the remains of the famed monastic buildings on the island still possess, including the low semicircular arches to doorways and windows that denote Norman workmanship. The accustomed eye can see it was, at first, a small Norman building consisting of a nave and chancel, lighted by small Norman window-openings, and entered by a small doorway, which still exhibits the low soft curve of the old Norman builders. The masonry consists of rows of small stones as nearly as possible of the same size, which, as time and weather have softened down their edges and left interstices between them, have a beadlike regularity. On the western end of this little ancient edifice Plantagenet masons built a strong tower. They took off as much as was necessary of the roof, and, on the Norman walls, raised two upper stories, firm, square, and compact. The manner of building with small regular stones in even courses had passed away, perhaps because there were then cleverer contrivances for lifting, and better appliances for removing, larger stones from the quarry; and we may see the Edwardian builders used larger stones in a more irregular manner. Here and there, when they found a stone was too small to keep the level of a course, they filled in the space with a smaller one, thus giving two to make up the height of one, in some places; although they preserved a general aspect, as well as certainty, of massive strength. Worn with sea-fret and the storms of five hundred winters, their work still stands intact and upright, though much of the rest of the original building has been taken down and removed to make way for modern enlargements. A Plantagenet tower has also been built on the west end of a Norman church at Ponteland, nearer the Tyne.

There is another warlike Edwardian tower at the west end of Ingram church. This stands in a wild country on a bend of the flat pebble-paved shore of the river Breamish, in the hilly district of the Cheviot range. There are hills in every direction, with their sloping sides strewn with great grey lichen-spotted boulders, and bright with heather and mosses; but between these hills there are valleys that must have afforded every facility for the operations of moss-troopers. The builders of Ingram Church, therefore, bethought themselves of a strong tower. "Go to," they may have said, "we will build us a tower." If there ever was a more ancient building on the site, but little use was made of it, for this fabric is built from beginning to end in the lighter manner that was in vogue after the Norman style was discontinued. Every arch is lofty as well as light; every window is long, narrow, and acutely pointed like a lancet. The chancel arch has the same delicate and venerable beauty, and at the west end rises the evidence of the insecurity of the district at the time of its erection. The plan of this tower is square. It has three stages, whereof the lowermost is lighted only by arrow-slits, the second by small square-headed openings, and the uppermost by double lancets of similar dimensions. It has a double chamfered base, and midway between it and the projecting parapet there is a "set-off," or sloping line of masonry, marking a slight reduction in the size of the topmost stage.

These fine old towers have another comrade at Ilderton. Only two stages of this one are left. The third has been rebuilt, with large window openings and a flimsy embattled parapet. All the rest of the church has been likewise rebuilt in the same poor unsubstantial fashion. But we can see there was originally Norman work in the edifice, for the masons who have rebuilt it have used up rows and rows of the Norman stones they found ready to their hands. They dealt in a very rough-handed way with the Plantagenet tower, as we have seen. Further, they broke an arched doorway through it, which is now the only entrance for the congregation. This tower is but 18 ft. square. In the south-west angle of it there is a winding stair in the thickness of the wall.

The tower of Eglingham Church has about the same dimensions as that at Ilderton, but it has not been so ill-used. It still stands its full height, looking across the wide sweep of country extending from the Cheviots on the one hand to Alnwick on the other, with its masonry intact. It is lighted with double lancets, just as the barbican of Alnwick Castle is lighted, and the only entrance to it is from the interior of the church. The second, or central, stage bears traces of having been used as a chamber. There is a small opening in the east side of it through which the services in the church could be observed, and on the north side is an aumbry or cupboard. The church suffered in the seventeenth century, when a Scottish army, under General Leslie, left it in ruins; but this tower must have looked down upon the war-wasted building comparatively uninjured, and, sentry-like, guarded the site till better times came round, and masons were set to work to repair the dilapidations. Within the last few years a chieftain among the antiquaries of the North has been at the cost of capping it with a high pyramidal roof, and causing careful repairs to be given to it.

Midway among the heathery and mossy moors that stretch from Alnwick to Rothbury, and close to Edlingham Castle, stands Edlingham Church. The castle does not date much further back than the Restoration, therefore the inhabitants of this district, remote from towns and help, fortified their church in earlier times. It was a small ancient Saxon edifice, one of the first built in the days of the Saxon Evangelists. A sombre tower was added to the west end of it in Plantagenet days, with no external entrance, and no windows below the height of a man. There were plenty of stones at hand on the surrounding moors; they only required fashioning. We may note the long quoins made to suit them. We may note, too, that the doorway, which opens from the interior of the nave, is furnished with receptacles for a strong bar on the outer side, as though persons had sometimes been prisoned in this tower.

Every Northumbrian church-tower is not of this military character, it must be observed. Some have great doorways into them, easily forced; some are capped with spires; and the lovely lantern of St. Nicholas, Newcastle, is an architectural feature with which most people are familiar. There is a very fine tower, for instance, at the west end of St. Michael's Church, Alnwick; but it has not the warder-like features of those just described. It has not been built for defence, for it has grand bold step-buttresses at each angle, from its base to its parapet, whereby a nimble man may easily climb to the top of its three stages; and wide traceried window-openings of the same ornamental fifteenth-century workmanship as the rest of its masonry. At the east end of the same church, however, there is a peculiar turret that has evidently served some purpose in Border warfare. It is on the south-east angle of the chancel. It has a winding stair in it, and an embattled parapet, and gives access to the roof, upon which are traces of a small chamber. Here may have been lodged a sentinel, or guard, when extra danger called for extra vigilance. The turret may have held a beacon-light, or it may have protected the guard whilst displaying signals and taking observations. Below the embattled parapet is a moulded stringcourse, and below this again, here and

there, are tiny slits to give light to the stone stair within. Now only used as a means of access to the leads upon the roofs, it stands basking in the sunshine of its southern aspect, acquiring with each summer's sun a deeper richness to the tints of its amber masonry.

One of these old Border church-towers has been nearly lost by fire within memory. The conflagration in question occurred in the Church of St. Peter, at Long Houghton, and was so considerable as to involve rebuilding the uppermost stage of the tower. It was then observed that the walls of it are 4 ft. thick, and 23 ft. long by a width of 22 ft. Its stalwart, sturdy comrades are not always quite so large. There is something more about Long Houghton tower worthy of note. It stands on the site of an old Saxon tower, and has the original Saxon tower arch incorporated in it. We can gather from the evidence of the stones that the church built by the first Saxon teachers consisted of chancel, nave, and tower. After standing 300, or, perhaps, 400 years, it was rebuilt all but the chancel arch (which must have been considered sound enough to be retained), and the arch and piers of the tower, which were also deemed sufficiently strong to serve as the beginning of a fortress that Scottish raids and moss-trooping customs rendered necessary for the safety of the surrounding population.

There is another of these towers, sea-bleached and wind-worn, at Newbiggen, yet with its fine strength apparent in every line of its honest masonry. The great sea comes almost up to the churchyard sward on which it stands, lazily lapping the sands, or raging and beating upon them, ever changing, but the gloomy grey tower, unscathed, unmarred, stands, an unvarying testimony to the needs of the troubled days of old. It is now surmounted by a spire.

A grand grave tower, with corbelled-out parapet, still stands at the west end of the Church of St. Mary Lesbury. This is very stern and rigid-looking. Lesbury was once the ecclesiastical centre of a large district, for in the twelfth century there were three chapelries attached to it,—Alnwick, Long Houghton, and Alnmonk. As time passed by, changes were effected that made the head-quarters of the Percies, Alnwick, of more consequence than the parent church, and the sufficient safety of the district was secured by the erection of the strong tower in question attached to the church.

There is historical testimony to the fact that Warkworth Church was the scene of a great slaughter when the Danes landed in its neighbourhood, and finding the inhabitants had taken shelter in the little Saxon church, surrounded it, and massacred them every one. About 100 persons are thought to have been slain on this occasion. A century after this outrage, one of these martial towers, 23 ft. square, was built at the west end. In a later century, probably after Warkworth Castle was built, when the tower would not be required to defend the inhabitants any longer, a spire was placed on the top of it, which still ornaments the structure.

There is a fine tower to Bolam Church, still more ancient than those before mentioned. It stands on the ridge of a slope looking over the wide domains of the warriors who held Belsay, Bolam, Meldon, and Mitford in the days of yore. Like the rest, it has three stages, and is only to be entered from the interior of the nave, as it has no external doorway; but it has the additional interest of a great antiquity, for close up to the parapet is a course of herring-bone masonry, marking its Saxon origin. Through the intervening centuries, when Norman masons took down the rest of the Saxon building, and Plantagenet masons afterwards took down nearly all the work they substituted for it, and wind and weather so wrought with this newer work, with its elegant detached columns and dog-tooth ornament, that it became old and grey and worn in its turn, this tower has held its own. The lowermost window openings have been tampered with and enlarged, but the uppermost stage still preserves in their integrity the Saxon openings, with the massy recessed baluster that divides each into two lights. Whittingham Church, in a neighbouring vale, still preserves the two lowermost stages of a fine Saxon tower. At Long Houghton there was probably a tower similar to these, but, as indicated, the Norman masons did not spare it, but took all of it down except the tower-arch. It is possible, too, there was a Saxon tower at Ingram, and that the arch still stands in the present Edwardian structure. Woodhorn Church, also, has preserved a Saxon tower arch. The Saxon towers appear to have been about 12 ft. square, and those of the Plantagenet period about 20 ft., more or less.

We learn, therefore, that on the Northumbrian border, in Saxon and in Plantagenet days, the parish church was not only the scene of the baptism, marriage, and burial service of the parishioners, and the centre to which they all gathered for worship on the Sabbath, but the literal stronghold to which they resorted when menaced by their enemies, and in which they placed their wives and children for safety when alarmed by the approach of enemies. After the great catastrophe of the Norman Conquest we may conclude there were fewer apprehensions, for the small Norman churches or chapels in the district have no towers. As time passed by, and the strength of the new strong hand relaxed, aggressions grew. The Scots became rivals, and towers were again in request.

Just as every nobleman had his castle, and every gentleman his pele, or tower, in this border country, when Edward was marching his great armies Scotlandwards, many parish priests likewise lived in towers within a stone's-throw or so of their churches. In some parishes there is still a tower to the church, as well as a tower in the vicarage-house, as at Embleton and Ponteland, whilst in others where there is a tower in the "mansion of the vicarage," to use the old phraseology, there is none to the church, as at Elsdon and Shilbotell. In fine, clergy, noble, gentle, and simple, from Plantagenet times down to the days of the Tudors, alike acted upon the impulse of the prophet, "I will stand upon my watch, and set me upon the tower, and will watch to see." We may assume a system of correspondence by signals was maintained from tower to tower, which increased their utility, and reduced the necessity for patrol.

THE INTERNATIONAL SANITARY CONGRESS.

A BRILLIANT assembly gathered in the Aula of the Geneva University to witness the opening of the Sanitary Congress.* The room, small in size, yet with its three galleries capable of holding a great many persons, was admirably adapted to the purpose. The feeblest voice could make itself heard. Every sanitary reformer is not of necessity gifted with powerful lungs.

Dr. Lombard, of Geneva, occupied the chair, and enthusiastic applause broke forth when Dr. Pasteur took a seat by his side. The speeches of welcome were, of course, pronounced by the Swiss local authorities, the first to speak being the Councillor-General, M. Schenck. He remarked that Switzerland was the country of all countries for international congresses, especially if their motives were calculated to be of general benefit to humanity. The preference which Geneva enjoyed was due not merely to her geographical situation, but to the ready sympathy of her population, and the ardent champions any good cause would find amid the Swiss people. It was to Geneva that the honour of the International Treaty for the succour of the wounded in war belonged; and at Geneva a great war had been prevented by the arbitration with respect to the Alabama claims. Switzerland having much to learn was particularly eager to welcome the Sanitary Congress. Her death-rate was not 17, but rather 25 per 1,000, and, therefore, the country was eager to accept good advice.

The delegate of the Council of State of Geneva, M. Hiridier, urged that hygiene would tend to do away with war, as the Red Cross Convention had already mitigated many of its horrors. Its strength rested on the spread of education, and Jean Jacques Rousseau, a citizen of Geneva, had been one of the foremost promoters of the cause of education. In ancient Greece, Rome, and Egypt hygiene held a high position. The ignorance of the Middle Ages alone caused its tenets to be neglected, and Europe was punished by appalling outbreaks of the plague.

M. Le Cointe, of the Geneva Municipal Council, insisted that the Town Corporation would be the first to benefit by the good advice of the congress, and invited a frank exposition of all local defects. The Swiss were a proud people, but they wanted light everywhere, and on everything, knowing that progress was always possible.

* See p. 349, *ante*.

Dr. H. C. Lombard, as president of the Committee of Organisation for the Congress, in offering his welcome, remarked that the members, though they could not expect a royal reception, might count on a cordial greeting. He then described the improvements already realised at Geneva. It was not the present generation but their ancestors, who were to blame for the narrow streets. Formerly the one large street used to be crowded with the stalls of a permanent market. Now this had been swept away, and rachitism was no longer constantly visible amid the population. To an American, named Church, they were indebted for the introduction of the first steamer on the lake, and when navigation became popular they were obliged to improve the unsightly waterside. The unwholesome sewers emptying from nondescript hovels into the lake were now removed, and beautiful embankments constructed in their stead. Afterwards, and as a more important improvement, came the destruction of the city walls, which hid air and light from the town. The handsome building where the congress was now united stood on the site of the ancient city moat. The population was not half so crowded, and there were large gardens both inside and outside the town. Geneva was built on an amphitheatre freely swept by the prevailing winds, notably the cold north wind. This might tend to increase inflammatory systems, but it carried away the germs of disease, and to this cold wind was attributed the cessation of the great cholera epidemic. The water drunk in the town was also remarkably pure,—one of the purest water-supplies of Europe, according to Professor Tyndall. The workmen of Geneva eat abundantly of meat, soup, and vegetables, and this contributes greatly to maintain the health of the population. Further, the visitors will have seen that the schools are built like palaces,—palaces not for the dwelling of kings, but for the education of the youths who are to become the sovereign people. Yet, if much has been done, still more remains to be accomplished.

The Secretary-General, Dr. P. L. Dunand, then read his report, from which it appeared that the Governments of France, Italy, Spain, Roumania, Hungary, Holland, Servia, Sweden, Mexico, Portugal, Prussia, Bulgaria, Canada, Switzerland, and Belgium had sent special delegates. Further delegates were sent by the municipalities of Rheims, Bucharest, Geneva, Paris, Lausanne, Neuchâtel, Rath, Seville, Lisbon, Nancy, Turin, and many other towns. A number of societies and academies from all these towns and countries had also sent official delegates.

Dr. Pacchiotti, Senator, president of the Turin University, and of the Third International Congress of Hygiene, which was held two years ago at Turin, then delivered a most eloquent speech, proposing that Dr. Lombard should be president of the present congress. We wish we had space to reproduce the poetic charms of this discourse. It was the most telling speech of the inaugural sitting, but an abbreviation would not do justice to this passionate exordium. Switzerland was the holiday land of all Europe. Here overworked and broken constitutions came to seek health, recreation, and happiness. It was the land of those who loved, and of those who had loved too well. Both gained strength in the contemplation of its beauties, and became wiser and happier. While war was raging in Egypt, and all Europe was arming, the Swiss were discussing hygiene. They were a truly happy people, and if Europe could follow their example it would become a vast Switzerland.

This allusion to Victor Hugo's dream of the United States of Europe was greeted with enthusiastic applause.

After some formal business, the first sitting of the congress was closed, and the members went home to prepare for the official reception held the same evening at the theatre by the town authorities.

The Trades Union Congress will be opened on the 18th of this month at Manchester. The principal business brought before it will most likely have reference to the amendment of the Employers' Liability Act. On this subject the trade unions and the miners' organisations of the country may be said to have fairly made up their minds. A Bill to carry out their wishes was, it will be remembered, introduced at the beginning of this year by Mr. Burt.

FROM GERMANY.

New Astronomical Observatory at Bamberg.—Dr. Carl Remeis, of Bamberg (Bavaria), lately bequeathed to his native city a sum of 20,000*l.* for the erection and maintenance of an observatory. The amount devoted to the erection of the structure will be 9,000*l.* A sum of 7,500*l.* will be invested to form an endowment fund for the payment of the astronomer who will be appointed to the observatory, and of the other officials, as well as for keeping it in repair. The remainder of the amount will be devoted to the purchase of instruments. The testator has, however, left the observatory a number of instruments as well as the money referred to.

The Munich Electrical Exhibition.—Following in the track of France and England (whose displays at Paris and Sydenham opened a new era in the development of electrical science), Germany has been preparing at Munich an exhibition of a similar character, the opening of which has been fixed for September 16th. In addition to numerous examples illustrative of the progress of electricity in various branches of technical research, its practical application to public and private uses will be shown upon a scale of importance commensurate with the position this branch of the subject now occupies in domestic and industrial economy. Amongst the features of the exhibition are the following:—

1. Free lectures by eminent men of science.
2. A free library, containing technical works as well as periodical scientific literature.
3. A well-arranged catalogue and a guide to the exhibition written in a popular style.
4. *Viva voce* explanations of the objects exhibited by a number of young scientific men, who will take it in turn to attend at the building, and will give the visitors all needed explanations.

The exhibition will be open until October 16th, according to the arrangements made in the first instance. Doubtless the object of limiting the time has been the probable difficulty of attracting many visitors from a distance at a late period of the autumn.

New Bridges at Berlin.—The Berlin Municipal loan of 1878 placed at the disposal of the authorities a sum of 4,000,000 marks (200,000*l.*) for the building of new bridges of a solid character, and designed to accommodate the present increased traffic. The works already executed and still in progress represent an expenditure of nearly 300,000*l.* To meet the deficiency and to provide for further works of the same kind, a second loan of 200,000*l.* is being raised. Should the deepening of the bed of the Spree take place (according to the present intention of the Prussian Government), the bridges still to be built can be on a level with the thoroughfares adjoining, or at a slightly higher level, without the navigation of the river being impeded. This would allow of the estimated cost of the new bridges still proposed (varying from 23,000*l.* to 45,000*l.* each) being materially reduced, the approaches having hitherto formed an important proportion of the total cost in each case.

Pavements in Berlin.—The Berlin police authorities, in their decennial report, speak unfavourably of asphalte pavement as compared with good granite pavement, so far as the safety of traffic is concerned. In addition to the numerous cases of horses falling, it is remarked that it is difficult to stop or turn horses quickly on the asphalte. Wood pavement is also found inferior to granite in this respect. It is stated that even on the worst stone pavement, fewer horses fall than on wood or asphalte. These assertions are based on actual observations.

The Berlin Hygienic Exhibition.—The active co-operation of the German Government in the exhibition is considered in well-informed circles as being rendered certain by the fact that the director of the Imperial Sanitary Department has recently joined the committee. The competition for the building of the new structure is confined to six firms. Twenty-two leading firms were invited to tender, but sixteen of them declined to do so on account of the multiplicity of their present engagements.

Gothic Architecture in Hungary.—According to a recent treatise from the pen of Abbate Lublich (custodian of the Agram Museum), there is in Hungary an older monument of Gothic architecture than any existing in Germany. The instance to which he refers is that of the church at Topuzsko (or Toplica), the ruins of which point to its having been designed in a pure Gothic style. The date assigned to it is about 1205, and the site would seem, by records still in existence, to have been granted by King Andrew II. to the Cistercian order, some members of which had come from the French Abbey of Clairvaux towards the close of the twelfth century, and settled in Hungary. The clergy were in those days their own architects in many cases, and the fact of the Gothic style having been adopted in this instance, goes to prove (according to the arguments adduced) that France was the home of Gothic architecture at an earlier date than Germany.

AN OCTOGENARIAN ENGINEER.

THE *Army and Navy Journal* of New York, of the 19th of August last, contains a reference to the fact that in that month the venerable Nestor of the profession of civil engineers, Captain John Ericsson, K.V., entered on the eightieth year of his age. We claim, on behalf of the civil and mechanical engineers of England, an interest in the health, wealth, and fame of Captain Ericsson. It is only due to one of those minor events,—accidents, as we ignorantly call them,—on which the turning point of human life so often depends, that we have not had to congratulate the father of the ironclad on keeping his eightieth birthday in London, or in Manchester. On the Liverpool competition in 1828 there is no doubt that Ericsson's engine, the "Novelty," was the best on the ground as regarded design. It was not of such stout and sturdy workmanship as the "Rocket" of Stephenson, and, breaking down more than once, the prize was adjudged to the latter. But no one who stood, on that memorable day, beside Ericsson on the foot-plate of the "Novelty," and saw the change that came over the face of Mr. Stephenson as the competing locomotive shot by his own on a parallel pair of rails, would ever forget it. As it was, Stephenson knew how to hold the lead that he had worthily acquired as a workman, rather than as an inventor, and Ericsson, thus failing to become the first man in the profession here, went a few years after to America,—without prejudice to his being regarded by those who knew him as the first engineer in the world. Now that age has put its silver crown upon him he is that, and without a second.

The *Army and Navy Journal* refers with appropriate respect to the labours of Captain Ericsson during the last two years. These comprise (1), the reconstruction of his original caloric engine (which was completed about 1834), and its application to pumping. The success that has attended this reconstruction is attested by the sale of upwards of a thousand of the engines by the Delamater Works within the last two years. Second, we place a high-speed steam engine for electric machinery, with a single steam cylinder of 5 in. diameter, and 3 in. stroke, making twenty-one revolutions per second, under steam of 55 lb. pressure on the valve; the Prony friction brake shows that a 12-horse-power is obtained. Thirdly, a solar pumping engine applies, by a method long since perfected by Ericsson, the rays of the sun to heat atmospheric air, and thus replaces such contrivances as the old windmills of the fens by a costless and mighty, if somewhat variable source of power. The fourth invention is the application of hydraulic training gear for changing the direction of the torpedo boat, the *Destroyer*, as to which we reserve any further remark. And the last is one which, although called forth only for the service of this last of the ocean children of the inventor of the *Monitor*, is capable of very wide application in war no less than in peace. It is the application of a reflector to the wooden backing of the *Destroyer*. By means of this, the helmsman and commanding officer, while standing on a grating placed so low in the vessel that their heads are 2 ft. below the top of the armour plates, are able to see both sea and sky forward of the vessel, and thus to approach the enemy while protected from his guns.

When we consider how small an elevation gives a commanding view over the flat level country, especially when the air is dry and clear, we cannot but think that a very small balloon, by no means adequate to carry an aëronaut, might be fitted with reflectors, and so managed by silken cords as to give to our look-out in Egypt very precious information as to what is going on behind the sand rampart of the enemy.

SELF-SUPPORTING RESEARCH.

HOWEVER successfully the scientific men may be able to combine, as they certainly seem to do in the present day, their well-directed studies with the principles of lucrative commerce, it can scarcely be said that the archæologist has as yet turned his delightful pursuit to any pecuniary profit. Happy student! like Agassiz the naturalist, he has no time to make money. It is alone his dependence on those sinews to carry on his war with the action of time, which are so requisite in every struggle that ever leads him to disturb a public who unfortunately he only too often finds indifferent to his appeals. His demands are never exorbitant. Of the millions ungrudgingly voted to be squandered on costly and not unfrequently useless experiments he would shrink from demanding even a tithe for his use. A few hundreds he finds the utmost difficulty in raising in a country where private fortunes are enormous. We are afraid the chief interest he finds awakened by his appeals in favour of his pursuit is,—as we remember to have heard the American sculptor, Horatio Greenough, say of his artistic appeals to the Senate of his country,—chiefly an antagonistic one. Subscription slowly supplies the sums requisite. It is sad to think how many are the directions in which the researches of the archæologist might be pursued were it not for the monetary difficulties that invariably hinder all consecutive study.

The plan of making antiquarian excavations self-supporting is admirable, and has been wisely adopted by the Italian Government. For some years past the system has been found to work well. It is true that in Italy there exists, as in France, a commission that watches over the historic monuments of the country. In spite of the efforts made in this direction, we seem almost as far off as ever from this consummation in our country.

The Italian Government derives a very considerable income from the admission of visitors to the national historic monuments, among which are numbered the museums. The traveller now is admitted through a turnstile, on the payment of a franc, to the Uffizi Gallery at Florence, the Brera at Milan, the Museo Borbonico at Naples, the Vatican at Rome, the local museums, such as those at Siena, and elsewhere; in fact, all the art galleries of the principal cities; and, greatest surprise of all (to those who remember Italy in the past), one enters Pompeii as one would the Crystal Palace or the South Kensington Museum.

By means of the funds thus collected, the Italian Government is able yearly to devote a handsome sum to the purchase, the restoration, the protection, and maintenance of existing historic monuments, and to continue its archæological researches, foremost among which come, of course, those in the buried cities at the foot of Vesuvius. All the old system of uncertain fees to *custodi* is abolished, and an agreeable branch of the Government administration has been organised throughout the country.

We have been reminded of this skilful settlement by the Italians of the monetary difficulties that so constantly beset archæological research, by the adoption of the system of self-support in the interesting Roman villa discovered now two years since at Brading, in the Isle of Wight. As we announced in these pages not long since, the ground on which (or, perhaps, rather, under which) the villa lies, has now, after having belonged to two separate owners, become the sole property of Lady Oglander. The tiresome difficulties which for some time had hindered any further research, having been now arranged, a turnstile has been set up, and the funds having accumulated,—thanks, also, to the aid of some generous subscribers,—work has just been resumed on the eastern side of the villa. Whether, however, the present proprietors are justified or not in their belief that still greater treasures are likely to be unearthed, we ourselves have some doubt, but that they are certain to discover other portions of buildings there can be no question whatever, numerous Roman remains having, it would appear, been found in the neighbourhood.

The discoveries so far made have been of such importance and exceptional beauty that it is alone the most sanguine who could hope to find any further work of equal merit to that already laid bare. What is at present placed before the public is of sufficient interest to hold out to the proprietors ample promise of a positively remunerative return for their efforts.

We foresee the villa near Brading becoming in time as much frequented as Pompeii. Not only the antiquaries, but the excursionists from the remotest parts, are paying Brading and its Roman villa a visit, and well may they do so, for, although the British Museum is filled with treasures of the greatest periods of antique art, there is no spot within four hours of London where may be seen, as they have been reposing now for hard on 2,000 years, such specimens of the art of antiquity as are to be seen in the Brading mosaics. It is not until the traveller should reach Pompeii that he would be able to see, apart from the interest attached to the residence of a refined Roman, a piece of mosaic work so grandly conceived and composed as that which covers the floor of the largest chamber in the villa.

Roman villas are no rarities, but villas containing works of art such as the pavements of the Brading villa are indeed rare. Those who in their visit to the Isle of Wight have the opportunity of comparing with this treasure the villa which has long been one of the attractions of Carisbrooke, where the few interesting remains of the home of a former Roman resident nestle under the walls of the famous old castle, can see at a glance, without requiring the erudition of the antiquary, the value, artistic and archæological, of the villa discovered at Brading.

IMPORTED IRON.

ALMOST unnoticed, a startling change has during the last few years, taken place in the metallurgical world. The iron manufacturers of Great Britain have come to depend in very great degree upon foreign nations for a large part of their raw materials. If we look back twenty years we shall find that the iron that was made in Great Britain was made almost exclusively of that smelted from our own ores; but this is far from being the case now. A few figures will show how great has been the growth of the demand for iron ore from other parts. In 1861 we imported 23,408 tons of iron ore, all, except a few hundred tons, being brought from Spain. Taking the importations in the total for periods of five years from that date, we find that by the year 1866 the importation had risen to 49,360 tons, and by the year 1871 to 335,033 tons. Again, in 1876 it was 673,235 tons, and in 1881 it was 2,450,696 tons; so that, roughly speaking, it doubled itself in every year named, except that in the last of the periods there was an increase much more than threefold. And it is worthy of note that Spain still supplies the great bulk of the ore thus brought in, for last year 2,227,486 tons were imported from that country, Italy and Algiers sending in the bulk of the remainder. Sweden used to send us large quantities of iron ore, but for the last seven or eight years it has sent us none; and Norway, once a large source of supply, sent us only 118 tons last year; so that it is from the countries of Southern Europe and Spain that our supplies are drawn.

This growth of the use of imported ores is due to one cause,—the increase of steel-production. Until the basic process was commenced it was tolerably clear that the great bulk of the iron ores of Britain were not suitable for use in the steel manufacture; and thus as the use of steel grew, there was an inevitable use of ores that were so fit. The rich districts of Furness and that of West Cumberland had ores that were so usable, and there was a continuous growth of the production of these; but there was a call beyond that that they could supply. And, moreover, many of the works that were on the coast could bring ores from Spain by sea cheaper than they could bring those by land, so that there arose the vast demand for ore that has caused the swelling of the imports shown in the figures above given, and that seems likely to continue, though probably not with such rapidity. There is now a systematic attempt to utilise our own ores by the basic process, and this will allow a portion of the steel that we use to be smelted from our own iron, and thus will at least lessen the rapidity of the growth of the imports of iron. But the fact that we use about 2,500,000 tons of ore from other nations, and that they cost with the carriage probably 1,500,000*l.*, is one that should be a very great inducement towards the further development of any and every system that will allow of the increasing use of our own resources, and that would retain a very large amount of money in this country. It is not to be expected that any such change will be very rapid. The imported ore and its product has made itself well known; that made by the basic process from our own ores has yet to win its way in many quarters. But whilst there has been only one large extension, that of Eston, where the process has been in use, there is now in course of construction one that will be equally large, and that will, in the course of a very few months, materially add to the production, whilst in the Shropshire and Staffordshire districts new works are in course of construction or in contemplation, and by these the basic process of steel production will be much extended, and the use of our own ores in the steel manufacture will be extended. It remains to be seen what effect the extension will have on the importation of ores; in the past that importation has been affected by political events in Spain, and that cause alone should induce as much as possible the substitution of our own ores for those the continuance of the supply of which has been broken at times.

COURTS AND COURTS: A REVERIE.

THE Long Vacation is drawing to a close, and we fall a-thinking in this wise:—The probabilities of a visit to London by Macaulay's New Zealander are yearly growing less; but, if in A.D. 2060* a single aboriginal should be left between Cape Maria Van Diemen and Port Pegasus, and, prompted by curiosity, he should take a trip to the Thames and wander along the Strand, his attention will doubtless be arrested by the Courts of Justice, and he may criticise the design as sharply as has already been done, and may continue to be done even to the time of his arrival.

How few of the million passers-by,—home-born or strangers,—as they look up to arch and spire, will, or can, picture to themselves the thirty-three streets, lanes, courts, and alleys that formerly covered the seven-and-a-half acre site of the new building. In a short time the Majesty of Justice will occupy her new palace, and law reign over the spot where but lately lawlessness was rampant. Never were courts and alleys inhabited by a motlier set. At the Punch Bowl, in Hemlock-court, the original Jack Ketch refreshed himself after his dreary work at Tyburn, or in the Strand, or wherever duty might call him. At the Bear and Harrow tavern, which stood close to the Strand entrance to Clement's Inn, died Nathaniel Lee,—"Mad Nat," the dramatist. The Assembly Rooms were in Star-court, and thither, two centuries ago, flocked the gay lords and knights and their ladies from Lincoln's Inn-fields, the Strand, and the streets around Clare Market. In Crown-court the Crown Tavern occupied the site of the palace of the Bishop of Bath and Wells; and Gully, who overcame Cribb in a pugilistic encounter for the "Championship," and represented Pontefract in Parliament, was host of the Plough Tavern, in Plough-court. From Boswell House, Boswell-court, in 1589, Gilbert Talbot wrote a letter of London gossip to his father,—Queen Elizabeth's doughty Earl of Shrewsbury. In this same court for a few years abode Lady Raleigh, widow of the famous Sir Walter. Hither also came Sir Richard and Lady Fanshawe. "In his absence," she writes, "I took a house in Boswell-court, near Temple Bar, for two years." In Ship-yard lingered a dreamy memory of Admiral Sir Francis Drake. In 1654 were published the banns of marriage, "in Newgate Market, upon three several market days, between William Faythorne, stationer, and Judith Grant, daughter of Henry Grant, of Michael's, Cornhill." Not long after the wedding the pair moved into Ship-yard.† But of all the vanished network of buildings Shire-lane was the most remarkable. It was so named, says Stow, because it divided the City from the Shire. It was the birthplace of Sir Charles Sedley, who sang to please an audience that did not place purity high among the virtues. Here at the Griffin Sir John Denham, another poet, while a student of Lincoln's Inn, would madden himself with drink and rush into the Strand to annoy and terrify the passengers. On May 1st, 1670, Antony à Wood, antiquary and biographer of famous antiquaries, writes, "Dined with Mr. Ashmole,"—a brother in ancient lore,—"at his house in Sheer-lane, near Temple Bar." Rocque, in his map (1736), names it Sheer-lane. Sometime previously to 1678, Andrew Marvell, in writing of a boaster, said "he sounds another trumpet than that in Sheer-lane." The Trumpet tavern, which stood half-way up the lane from the Strand, had under the first-floor window a small sign-board, on which was depicted a trumpet, and was one of the oldest licensed houses in the metropolis. The "Tatler" frequently "marched down Sheer-lane at the top of which I lodge," to the Trumpet, and from it he dated many of his papers, and it had for its landlord Christopher Katt, in whose parlour Tonson, Steele, Addison, Walpole, and other bright spirits were wont to assemble. But who knows not the story of the Kit Katt Club? Not far from the Trumpet lived Hoole, the translator of Tasso, who had for almost daily visitors Dr. Johnson and Dr. Warton. These are pleasant scenes in the tragi-comedy enacted on this stage of seven and a half acres, but there were others, alas! in which the woman lost to shame, the thief, and the murderer played their parts. In every court and alley there was a larger percentage of poverty and vice than could be found in any similar amount of space in London. Newcastle-court, up to the day of its demolition, was a synonym for all that is blackest in the schedule of crime. Strange anomaly that the Bible public-house in Shire-lane should have been the rendezvous of the unlovely families of the Jack Sheppards and Moll Flagons.

Over this tragi-comedy the curtain has fallen to rise on a new drama, in which the misery and suffering of hope deferred and the law's delay may flit across the scene, but no parts shall be assigned to loathsomeness and horror.

* See *Builder*, vol. xxix., p. 470.
† Ibid., vol. xliii., p. 219.

SURVEYORSHIP ITEMS.

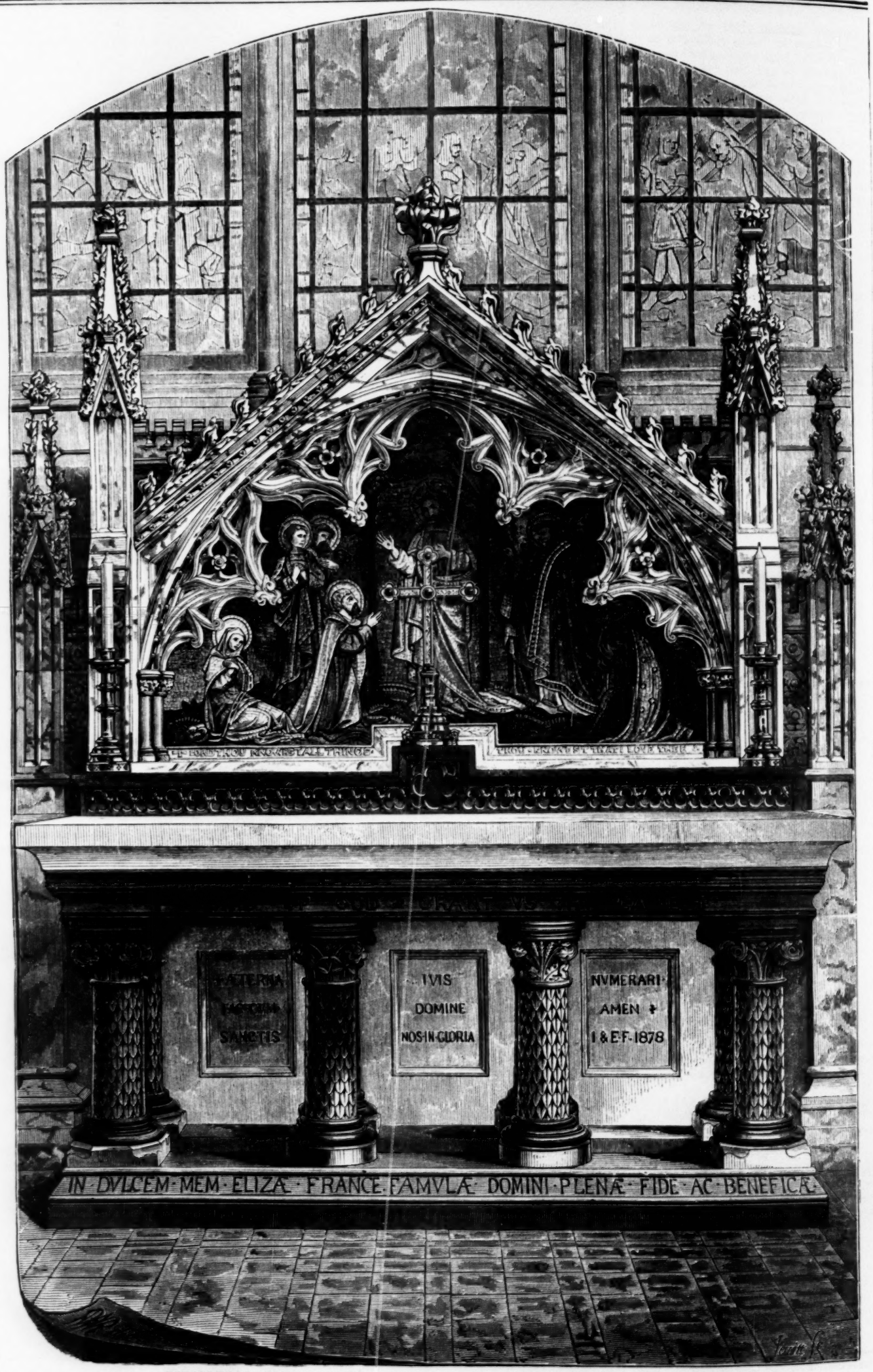
Congleton.—On the 4th inst., a meeting of most of the members of the Congleton Town Council and of the Borough Bench was held in the Council Chamber of that town for the purpose of presenting a silver tea and coffee service to Mr. W. Blackshaw, the Borough Surveyor, on the occasion of his leaving Congleton for Stafford, to which town he has been appointed Borough Surveyor. The presentation was made by the Mayor (Mr. T. G. Sheldon), who, on behalf of the subscribers and the Council, expressed their sense of the value of Mr. Blackshaw's services and their best wishes for the success of his future career.

Darlington.—At a meeting of the Darlington Town Council on the 7th inst., the first business on the agenda was a motion of Mr. Wharton, "That three months' notice be given to Mr. Smith, the Borough Surveyor, and his staff; also to Mr. Armitage, Borough Accountant, and his staff; and that a General Purposes Committee be called by the Mayor within one month to take the question of the salaries into consideration, and to re-arrange the above staffs." The motion found no supporters. Mr. Smith's salary is 350*l.* per annum, and he has three assistants.

BUILDING IN PARIS.

ACCORDING to recent statistics, the number of houses in Paris is 82,352, against 71,873 in 1876. It appears, therefore, that within five years 10,479 new houses have been built. In 1876, the average number of inhabitants per house was 26; it has since risen to 27, a greater increase of the population having taken place than in house accommodation. Over-building does not seem to be in progress in Paris.

The Great Eastern Railway Company's New Quay at Parkeston.—Owing to the enormous increase in their Continental goods traffic, the Great Eastern Railway Company have opened their new quay at Parkeston for the landing and shipment of merchandise somewhat earlier than they contemplated. The quay is so far completed that three berths are available, with a depth of water alongside of from 16 ft. to 27 ft., according to tide. One of the warehouses on the quay is also completed, and part of the station-building. During the past week two extra vessels,—one from Antwerp and one from Rotterdam,—with full cargoes, have been discharged and loaded at Parkeston. The company intend running two extra boats a week from Rotterdam, and extra boats as required from Antwerp during the present pressure of traffic.



MEMORIAL REREDOS IN LADY CHAPEL, CHICHESTER CATHEDRAL.

MR. CARPENTER AND MR. INGELOW, ARCHITECTS.

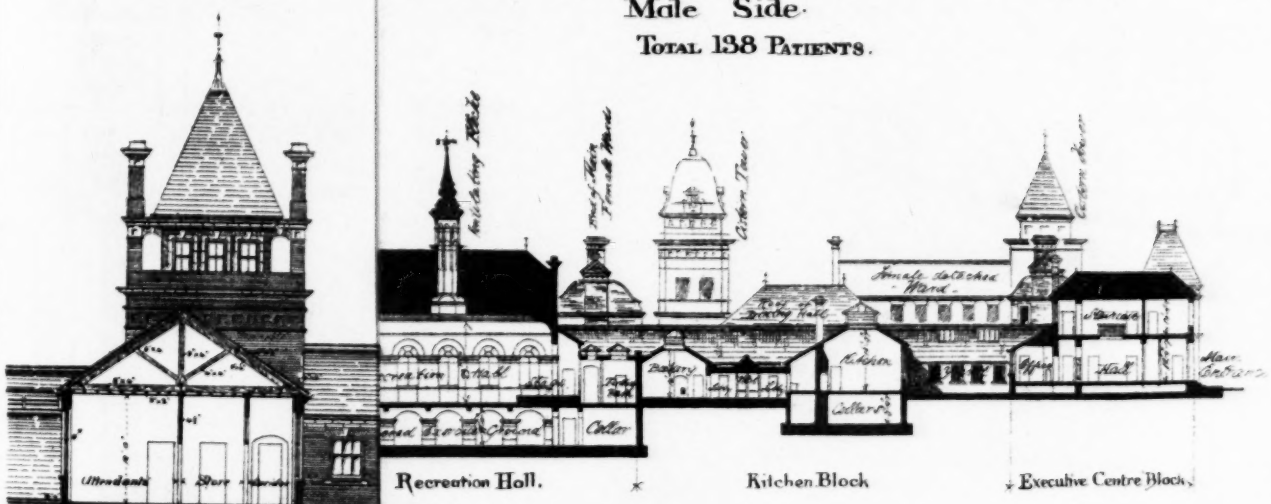
Infirmary Ward

Working, Quiet, & Chronic Wards

Infirmary Ward.

Male Side.

Total 138 Patients.



Recreation Hall.

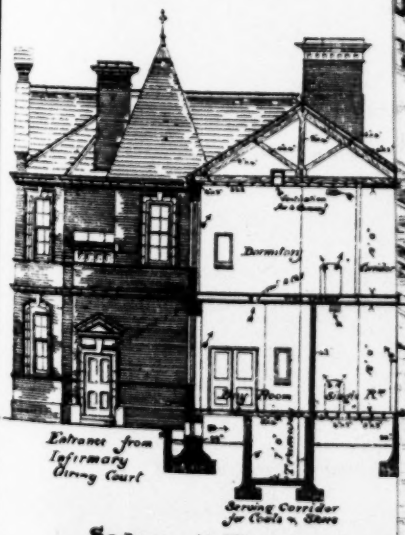
Kitchen Block

Executive Centre Block.

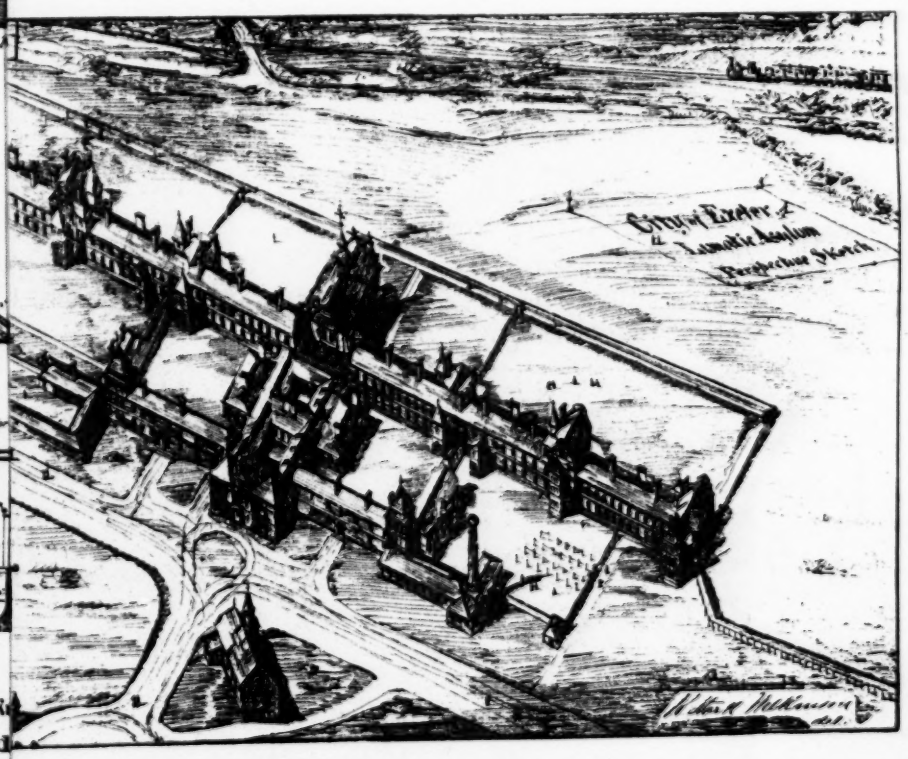
Transverse Section thro' Centre of Buildings

(on line C.D.)

Section thro' Laundry Ward



Section & Elevation looking Thro Main Ward



Whiteman & Bass, *Photo-Litho* 236, High Holborn

Wyman & Sons, Printers, 74 Queen St.

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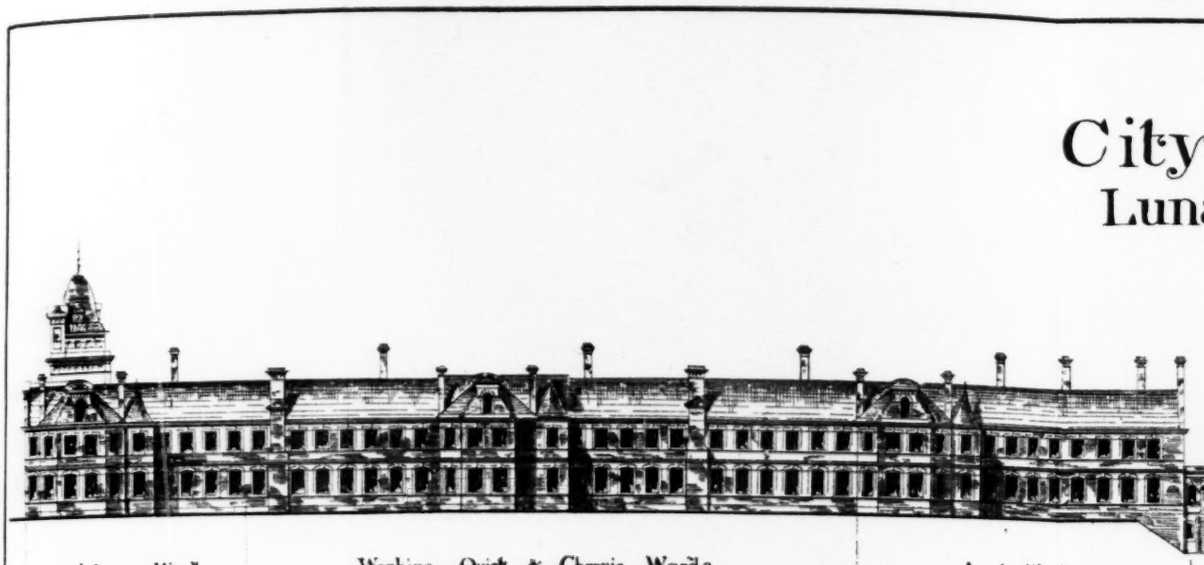
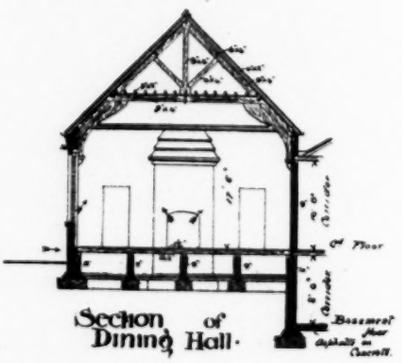
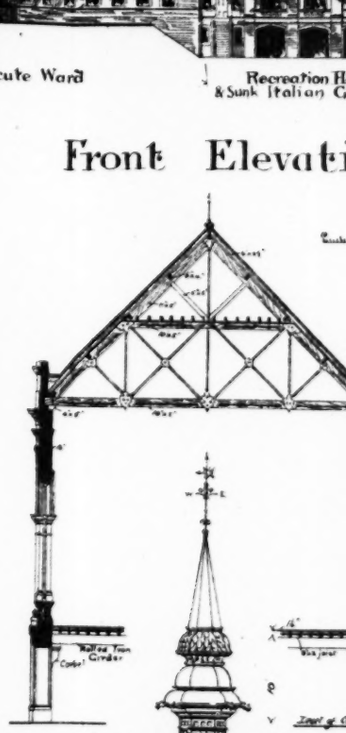
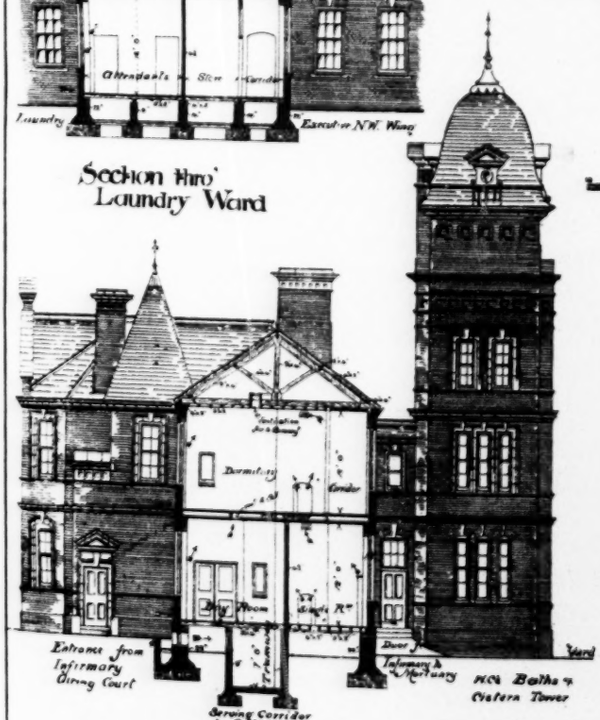
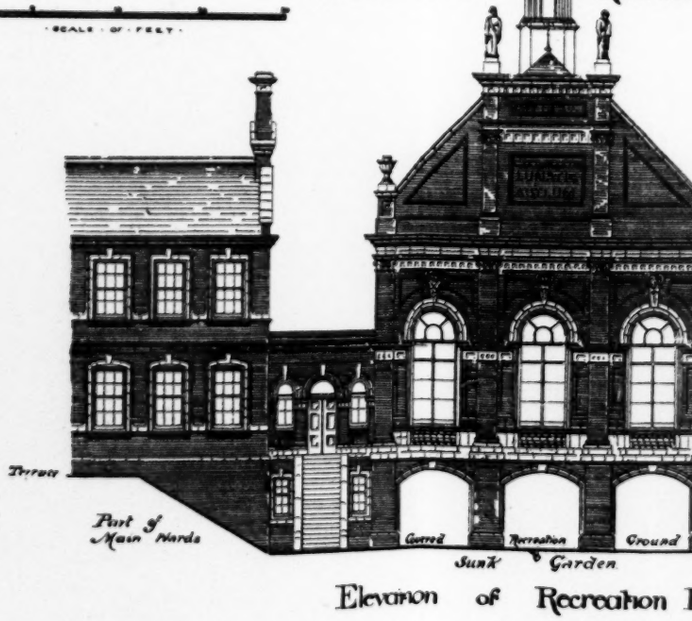


Front Elevati









Whiteman & Bass, Photo-Litho 236, High Holborn

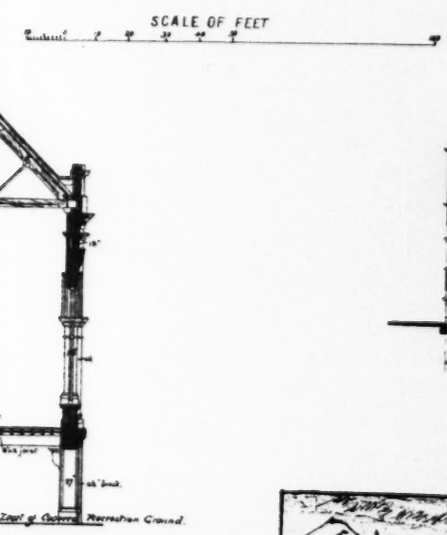
f Exeter.
c Asylum.

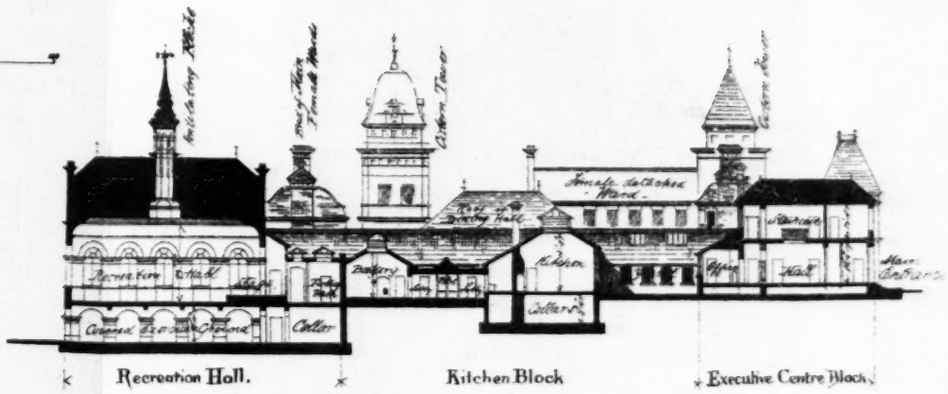
ation Hall. ian Garden — Acute Ward. — Working, Quiet, & Chronic Wards — Infirmary Ward.

Male Side.

TOTAL 138 PATIENTS.

ation *facing S.E.*



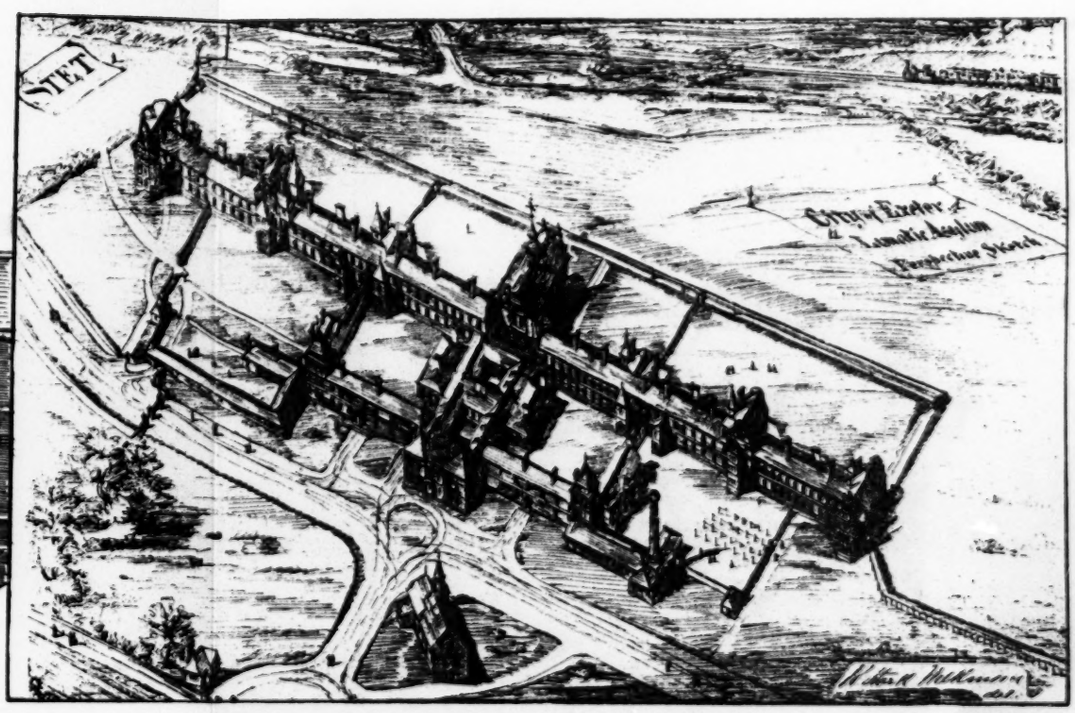


Recreation Hall. — Kitchen Block — Executive Centre Block.

Transverse Section thro' Centre of Buildings

(ON LINE C.D.)

reation Room



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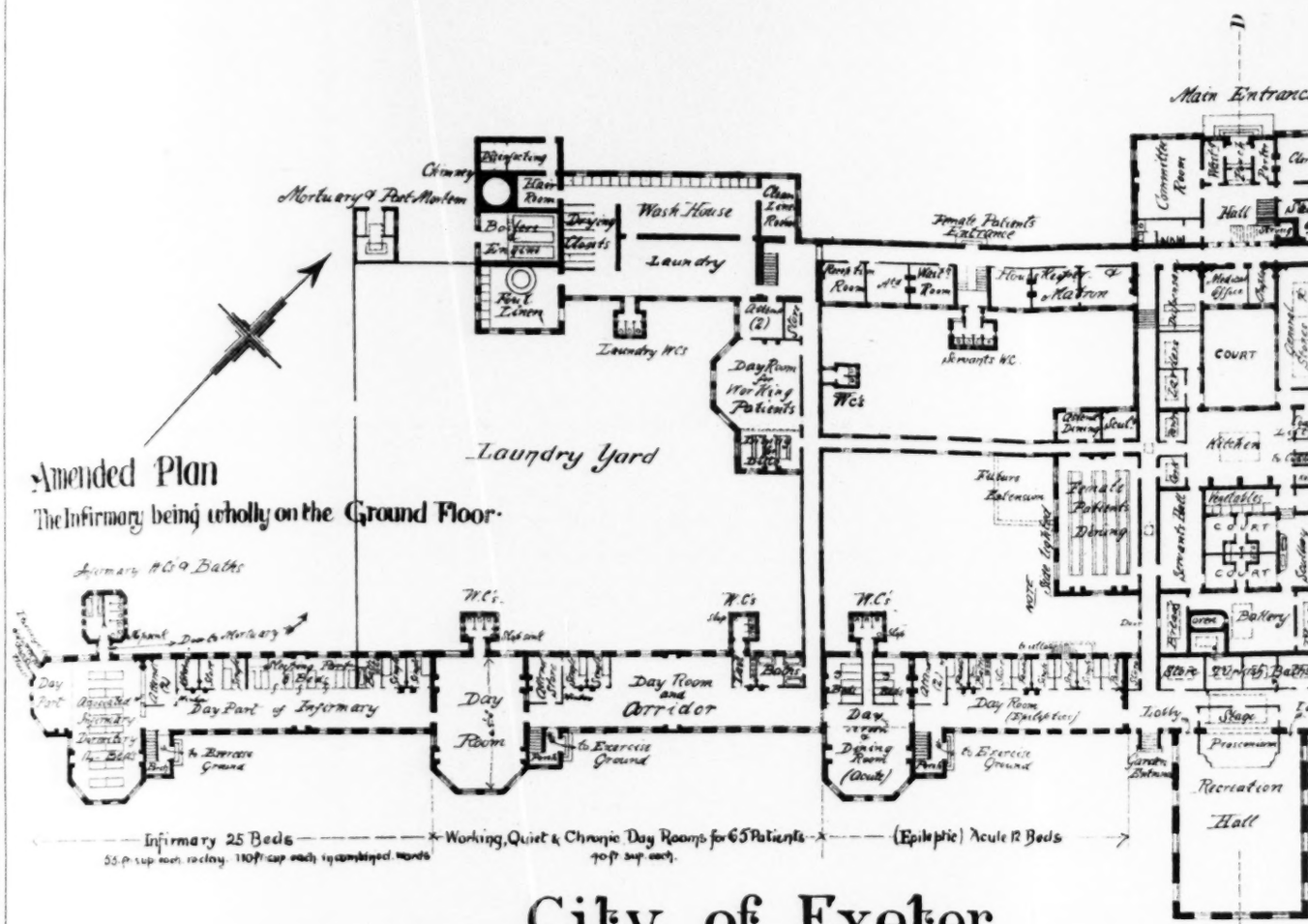
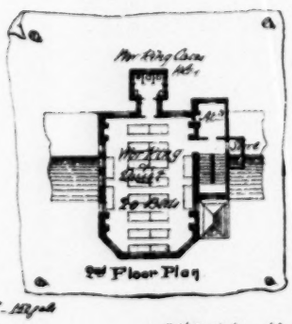
Wyman & Sons, Printers, 74 Queen St.

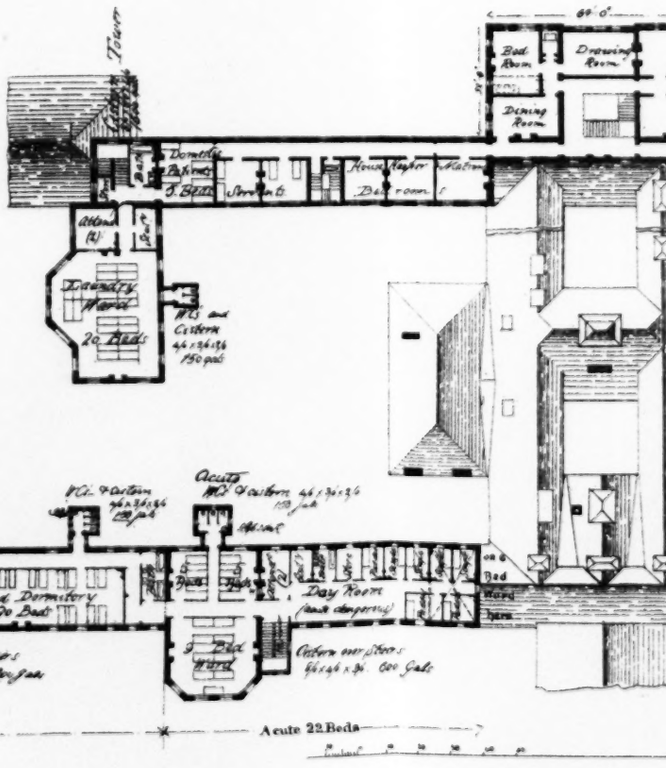


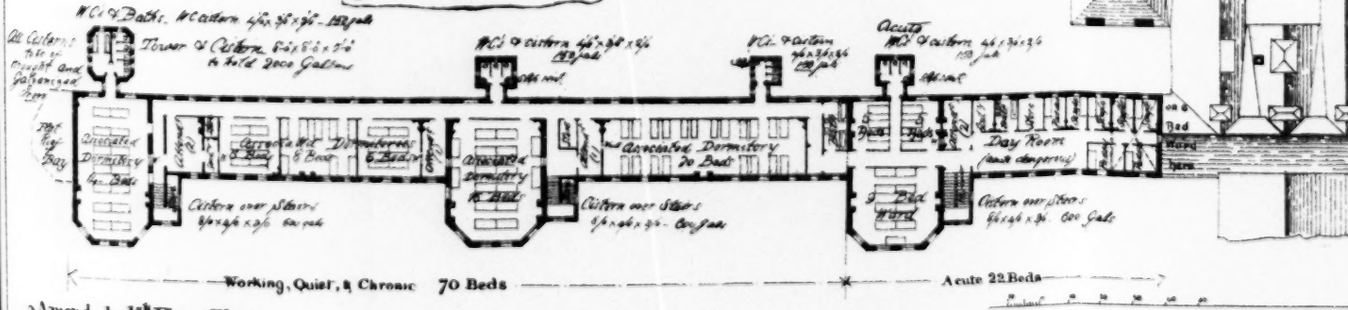
City of Exeter

Female Side
Total 162 Patients.

In amended Plan this 2nd Floor would only be used for Future Extension.

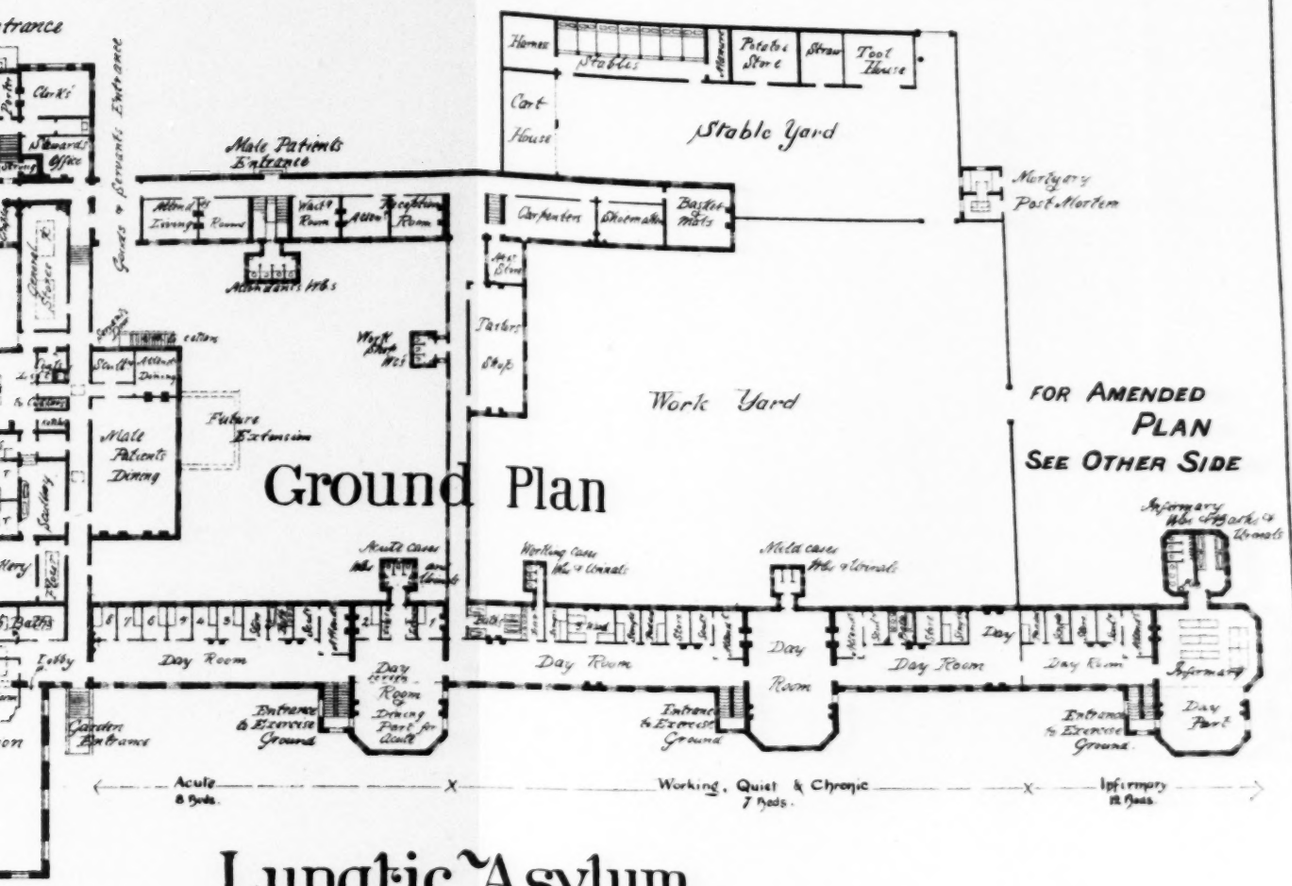






Amended 1st Floor Plan.
All Dormitories on 1st Floor extending over Infirmary

Ackerman & Bass, Photo-Litho, 236, High Holborn



FOR AMENDED PLAN SEE OTHER SIDE

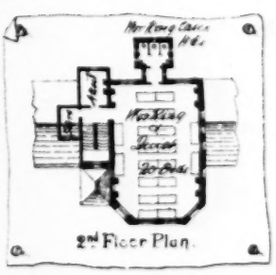
Ground Plan

Lunatic Asylum

Male Side.

Total 138 Patients.

1st Floor Plan



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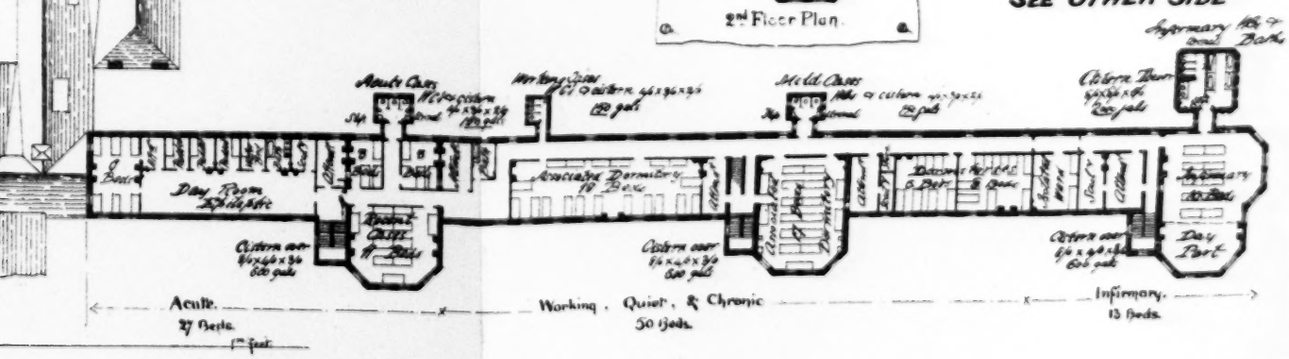

Wyman & Sons, Printers, 6 Queen St.

MONUMENT TO PARMIGIANINO, PARMA.—PROFESSOR GIOVANNI CHIERICI, SCULPTOR.

PAGES MISSING

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NEW SCHOOLS AT ST. ALBAN'S.

THE new school buildings erected by the School Board here are now in use; they afford accommodation for 250 boys and 300 girls and infants. The new boys' school is in the Hatfield-road, and is about 60 ft. north of the old school belonging to St. Peter's parish, which was handed over to the School Board when the latter was formed. A playground extends on the north of the new structure up to St. Peter's Churchyard,—the average size of this ground being 110 ft. by 130 ft. The plan of the school is so arranged that accommodation for an additional 100 children (making 350 in all) can be provided at a future time without disturbing the present buildings to any extent. The site not being a prominent one, the architects were instructed to make the building of good outline, but very simple in detail. The walls externally are faced with a greyish-coloured brick obtained from Pepperstock; the roofs are covered with red plain tiles. A shelter-porch, under which the children may assemble before school-hours in bad weather, gives access to the school-porch, from which the schoolroom and the class-rooms are reached. The schoolroom is 62 ft. by 22 ft., 14 ft. high at the eaves, and about 20 ft. from the centre. There are also large recesses for cupboards, &c. This room will accommodate 130 children. The principal lighting is by a range of windows in the north wall, and there are also windows to the east and south. This arrangement, by which the principal lighting is derived from the north, applies to the main rooms in all the three schools. Each class-room is intended for sixty children, and is 29 ft. 4 in. by 22 ft., and of the same height as the schoolroom. The entrance to the building can be reached from each of the rooms without it being necessary to pass through any other room. The cloak-room and lavatory are sufficiently large to provide for the total number of 350. Wood-block floors, laid herringbone-wise, have been used for the school and class rooms of all the schools, both for upper and lower floors. In the upper floors the blocks are 20 in. long, so as to suit the joists, and bedded on dry pugging and fine sand. On the lower floors they are laid on cement concrete, finished with a floated face of cement. The latrines consist of six water-closets for the boys and one for the master, and a range of urinals with rubbed slab slate channels, foot paces, divisions, and wall linings. The closets have louvres in the front enclosures, and are covered with skylights, and in them Messrs. Bowes Scott & Read's patents have been applied,—the glazed earthenware tubes being jointed with Stanford's patent joints. Flushing is arranged for by means of Field's self-acting annular syphon, each flush being 100 gallons. None of the floors in the school and class rooms are graded, but the desks are of different heights. The "Invincible" school-desks, made by Messrs. Philp, of Atlas Works, Liverpool, have been used in this school.

A site on the west side of the Alma-road was purchased in order to erect schools for girls and infants, much wanted in the large neighbourhood which has grown up between the Marlborough-road and Midland Railway Station. As the surface of the ground was considerably below the level of the Alma-road, the infants' school was put at the lower level and a girls' school over it. Both the playgrounds are reached by sloping ways, so that there are no external steps. The houses in the Alma-road are of a good class, and the Board, therefore, directed that a good-looking building should be erected, which would be an ornament to the neighbourhood. Box-ground Bath stone has been used for stone sills, mullions, and lintels to the windows. There are also moulded stone string-courses, water-tables, &c. The bricks are of a dull red. Plain tiles cover the roof, with barge tiles and finials. The playground for infants, in the northern portion of the site, is about 35 ft. by 100 ft. At the west end of the building is a play-shed for infants, 20 ft. by 22 ft., which will also serve as a shelter-porch. The schoolroom for infants is 44 ft. by 19 ft., and 14 ft. high. It is fitted with a gallery of raised seats at the west end, providing accommodation for sixty children; there are also desks for the elder children. South of the schoolroom is a babies' room, 17 ft. by 16 ft. On the upper floor is the girls' school, the schoolroom being 68 ft. by 19 ft. 9 in. There are also large recesses for cupboards, desks, &c. It is 14 ft. high at the eaves and 19 ft. in the centre. The class-room is on the south of the schoolroom, over the babies' room. This school is reached from the playground level by a stone staircase constructed in the most approved manner with short flights of easy steps, half-landings, and solid walls between the flights. The girls' playground is on the south of the buildings, and is about 40 ft. by 120 ft. It is reached from the Alma-road by an inclined path. The sanitary arrangements of these schools are especially adapted to their requirements, but are in principle much the same as those in the Hatfield-road school.

The heating in all the schools and class-rooms is by Shorland's Manchester grates. Fresh air is also supplied to the rooms by what are known as Tobin's ventilators, fitted with perforated zinc, and with valves and lids for regulating and shutting off the supply. The spaces above the collars of the roofs form ventilating chambers. There are also extraction-flues in the chimneys, Boyd's iron flute plates being built in next the smoke-flues. All the rooms, staircases, &c., are lighted with gas.

The accepted tender for the Hatfield-road school amounted to 2,210*l.*, and that for the Alma-road school to 2,483*l.* The Board, however, have incurred further outlay in order to secure greater perfection in regard to the heating, ventilating, and sanitary arrangements, &c. There have besides been the fittings to provide for.

The contractor for the Hatfield-road School is Mr. D. Ireson, of Waterloo, Northampton, his representative on the works being Mr. F. W. Austen, and the foreman Mr. Samuel Bayes. For the Alma-road School the contract of Mr. C. Miskin, of St. Alban's, was accepted, his foreman on the works being Mr. Henry Hilliard. All the buildings have been designed and superintended by Messrs. John & S. Flint Clarkson, of London and St. Alban's, the architects to the School Board.

EAST SUSSEX, HASTINGS, AND ST. LEONARD'S INFIRMARY ARCHITECTURAL COMPETITION.

QUESTIONS open to serious consideration relating to the above competition resolve themselves into grave and complicated difficulties, some of which cannot too soon be made public to restore the confidence to so many able and generous minds who have placed a host of wealth and genius into the hands of the committee of management in good faith that justice and merit would be the reward.

The conditions given, or rather sold, out to the competitors or those who desired to take up the invitation, were clear and pointed in their requirements, with certain equally clear and prominent stipulations as to the way such drawings were to be prepared and to be received in competition; with equally precise and strict points which should disqualify any transgressions being made or attempted. Such being the case, no doubts could exist in the intentions put forth to regulate the order and comparative character of the works when submitted.

Any one acquainted with the conditions could not fail observing at the first glance into the convenient rooms and looking at the magnitude of drawings sent in and exhibited, that a grave breach of faith had crept into them,—I allude to the colours on the plans and sections as violating the conditions which alone should disqualify those who took such liberties.

The conditions state:—"The geometrical elevations to be without colour or shading of any kind, except a flat tint of Indian ink to the door and window openings, and on the roofs if desired. *The walls, &c., of plans and sections to be shown in Indian ink.*"

The words italicised, in justice to the many competitors who sent in untinted plans, should be a safeguard that they alone could be dealt with in the competition. See 7th section, schedule B, of the conditions. The above is clear and decisive, and should be a protection, not a snare; for there cannot be the slightest doubt a plan deftly tinted puts those not tinted at a discount, and, though equally worthy, they do not get so carefully looked into, nor are they so readily impressed upon the minds of others. This should have been so treated by the assessor beyond a doubt, or otherwise his judgment is null and void.

The competitors may have been advised that such liberties would be allowed, but in the name of love of justice, with such conditions in print, who has the power to say ay or nay to such a privilege without the full knowledge of all concerned? They have acted, presumably, upon the slender, though courted, compliance, for I cannot believe any one would run the risk on his own responsibility. By such acts they rightly deserve exclusion for taking such advantage, well knowing it must be to their gain and attraction if passed over. I venture to think the faithful ones should have the protection which I hope it is not too late to give.

I will next refer to the premiated designs 1, 2, and 3, all of which should be out of the competition for "violation of conditions" on the first ground alone, but I will go further as to their merits, looking into their fitness for such an institution, and I am sure it will be clearly seen that the assessor must have treated the conditions as waste paper, and overlooked the special requirements of a hospital for sick and infirm patients. All of the three premiated designs have the out-patients' department in the basement. As one accustomed to hospital work for twenty years, I know such an arrangement is fatal to any proper working of such a department. What proportion of patients are able and fitted to go up and down stairs? It is as much as many can do to crawl, if I may use the expression, and many others have to be supported or carried.

Another defect in No. 1. The children's wards have no water-closets but by crossing a wide main corridor, leaving their wards, of course, and thus being exposed. There are only two bath-rooms on each floor, and those very small, to accommodate thirty-eight patients, mixed together,—that is, adult, children, and dirty cases; this should be enough to condemn the plans at once. The wards are fairly well arranged, but at the sacrifice of the working part. There are but two nurses' rooms to six wards, one on each side, which have to serve all purposes,—quite insufficient. There are some good points in the plan, but the bad are sufficient to condemn it.

Premium No. 2 goes to a very industrious aspirant, who actually sends in no less than three complete sets of designs, all tinted, but without much else to recommend them, as they contain a mixture of bad points. The rise of the ground 19 ft. appears to have been forgotten, and not seen, as there are numerous windows on the ground-floor opening into *earth*, from which there is no possible chance of gaining any light, as the ground would be 5 ft. above the first-floor level. Where was the assessor? Could he have been prompted by charity at others' expense? The areas at the back are all close and confined, making, as it were, dark wells for the admission of light and air. The kitchen arrangements are absurdly small. The *post-mortem* and dead house are placed in the front, next to White Rock-place, exposed to the full sun and public gaze, and obliging all bodies to be conveyed into and through the basement. The arrangement of wards is incomplete, having no water-closets connected with them, and only four to thirty-nine patients, without any separation, except the sexes, for each ward and children, and to get to them the patients must leave their wards, cross main corridors, and then have some distance to traverse before they reach them. This is most painful to contemplate, and more so when it is qualified with the second premium. The baths are equally small, two to thirty-nine patients, all mixed,—that is, for general use to adults, children, dirty, and contagious cases. Nurses' rooms,—small and inconvenient, I think,—one to four wards. Staircases poor and cramped.

Premium No. 3.—The out-patients' department is in the basement; the patients have to get down stairs, and after treatment perambulate a circuitous route upstairs into the hospital for medicines. This is a violation; the "out-patients were not to enter the main building." It could never work, as not eight patients in ten could do it. Wards, baths, and water-closets are badly arranged. Dark corridors, ventilated through water-closet,—lobbies at each end. *Post-mortem* in the basement, and very dark approaches. This plan is a shade better than Premium No. 2, but has much the same character of faults.

Finally, their cost, which must not exceed a stipulated sum more than 10 per cent.,—a very ready test, you will say, and I to that agree.

First premium estimate, 25,000*l.*: a modest sum, considering that at 9d. per foot cube, for

which possibly it might be built, but not for less.

Second and third premiums, both very low, 15,000*l.* and 17,000*l.* thereabouts: a startling difference, even with the 10 per cent added, and the buildings themselves are more pretentious than in the first design, and certainly quite as expensive.

All these points, faulty and unjust as they are, are combined in the three premiated designs. What about the others?

They comprise a wealth of ingenuity not met with in the foregoing, though I regret that many, which have some excellent points, utterly fail in making a building fit for sickness and infirmities. I, however, believe there are some few most worthy designs to choose from, and which will be found nearly approaching the acme of the conditions, and should not be overlooked. I allude to untinted plans of the highest merits, embodying most of the best features of a modern hospital.

I will not venture to direct attention to these, for if the conditions are regarded they can be readily seen; but merely for the love of fair play and justice to those who are so unfortunate as to be shifted, but not beaten, I make known the facts, in the hope that it will be followed by restitution of rights to those more worthy.

FAIR PLAY.

THE NICHOLSON INSTITUTE, LEEK.

THE site of this building, which is quite central, lies upon the north side of Stockwell-street, and comprises a ground area of more than 10,000 ft., including the space occupied by an interesting stone house of the seventeenth century, which it was fortunately found possible to retain without detriment to the convenience and utility of the new edifice.

A quadrangle is thus formed between the edifice and the street, in which the hum and rattle of the outer world will lose the track of the tormented student seeking sanctuary in the Institute. This space may receive, too, such treasures of hoary vestiges and wrecks and waifs of time as cannot well be offered "logement à pied ou à cheval." By taking down a portion of an adjoining modern block of buildings ground is obtained for a spacious entrance with foot and carriage gates of wrought iron, supported by massive stone piers.

The plans of the Nicholson Institute promise a building of a severe Classic Renaissance character. The materials adopted by the architects are thin hard-fired local bricks and red Roche and Aston stone, with brown Broseley tiling upon the roofs. All the floors will be of wrought-iron girders and cement concrete (covered with wood block paving), quite impervious to fire, noise, or other risks.

The leading feature of the principal front, which faces south into the quadrangle, is the tower, containing the portico and staircase, and rising to a height of 100 ft. from the street. Its domed roof will be entirely covered with copper. In the upper stage it has large oval windows, enclosed by carved pilasters and swags of foliage, and the lower stage is filled by the richly-carved entrance-doorcase and the pedimented window upon it, together 40 ft. high. To the left of this front we have the main gable, 70 ft. high, curved in outline, and with a carved pediment, in harmony with the tower decorations, flanked by two small turrets, terminating in stone domes. At the foot of this gable is the large bay-window of the committee-room and rooms beneath. The remainder of this façade, between the tower and the gable, contains large windows lighting the hall, &c., and bearing upon four large medallions under a carved pediment the effigies of eminent writers or painters. The eaves are finished by an open balustrade surmounted by urns.

The windows are of ample size, transomed and mullioned, and glazed with clear glass in lead quarries. The other fronts are simply treated to follow the general lines of the south front.

Internally the building has three floors, the central one being some 9 ft. above the street; the ascent is made partly by steps and partly in the incline of the approach.

On the lower floor is placed the school-of-art accommodation, entered separately from the east side; also the library basement and the stokeries, storage, lavatories, &c. Sloping north lights are secured for the art class-rooms.

The central floor comprises the entrance-hall, &c., reading and news rooms and committee-room, and the library, which runs up through both stories, and is lighted entirely by a large domed glass roof. The manifest advantages of this position for the library are that none but the attendants have actual access to the book-shelves and presses, which are carried upon open iron galleries round this lofty room; the attendants' and readers' respective occupations do not clash; and the books themselves are isolated and preserved from the damage caused by the vitiated air which must accumulate near ceilings before it can be drawn off by ventilation. Mr. Conell (the Liverpool librarian) stated at the annual meeting last week of the Library Association that "the money value of replacing bindings of books,—attributable to the effects of gas,—was enormous." The library, with its contents, can be fully seen from the other portions of the building through lofty openings, fitted with glazed screens.

On the upper floor are the picture-galleries and museum, with landing and cloak-room. The major picture-gallery is to have a platform for chamber concerts or lectures, upon which occasions chairs will be sent up to the room from the storage by a lift. All this floor will be lighted by clearstories at a suitable height, to obviate any danger of glitter on the pictures from the incidence of the light, this method of lighting being regarded as more comfortable and substantial in appearance than the glass shed roofs frequently make use of.

The following is a list of the accommodation and its extent:—

	Width.	Length.	Height.	Area.
Large picture-gallery	25 ft.	66 ft.	32 ft.	1,650 ft.
Two smaller galleries	16 ft.	19 ft.	22 ft.	608 ft.
Museum, &c	25 ft.	56 ft.	32 ft.	1,400 ft.
Reading-room	25 ft.	50 ft.	15 ft.	1,250 ft.
Newsroom	25 ft.	40 ft.	15 ft.	1,000 ft.
Library	20 ft.	40 ft.	45 ft.	800 ft.
Committee-room	18 ft.	25 ft.	15 ft.	450 ft.
Hall	17 ft.	52 ft.	15 ft.	884 ft.
Elementary art-school	25 ft.	37 ft.	13 ft.	925 ft.
Second ditto and master's stores	20 ft.	37 ft.	13 ft.	740 ft.
Advanced art-school	24 ft.	25 ft.	13 ft.	600 ft.
Entrances, lavatories, library basement, storage, &c.				2,000 ft.
Total super.				11,707 ft.

The works are being carried out to the plans, &c., of Messrs. W. Sugden & Son, architects, of Leek, and under their superintendence, by Messrs. Inskip, builders, Longton; Mr. Philips, plumber, Leek; and Messrs. Haden, engineers, Manchester.

The amount of Messrs. Inskip and Philips's contracts (exclusive of cost of site, heating, and ventilation, and all fittings) is 8,683*l.*

RESTORATION OF THE MANOR HOUSE, EVERLEIGH, WILTS.

THE Manor House, Everleigh, the ancestral home of the Dugdale Astleys, and traditionally a residence of the old Saxon king Ina, whose hunting-lodge is said to have stood near the Sidbury encampment, was totally destroyed by fire at Christmas last. Fortunately, the billiard-room, ballroom, orangery, conservatory, and an extensive range of servants' offices and stables were saved, although considerably damaged. This mansion (for the original Manor House is now a comfortable hostelry and hunting quarters) is supposed to have been built by Sir Ralph Sadlier, to whom the lordship was granted by Henry VIII. Sir Ralph was afterwards falconer to Queen Elizabeth. His portrait and all the family pictures, with one exception, were preserved, and will have a place in the new building. The old drawing-room,—a handsome and spacious chamber, with carved oak panelling, and a decorated ceiling in the style of the period,—was totally destroyed. The romantic and picturesque surroundings of the house, which nestles in a well-sheltered and secluded spot in the vicinity of Stonehenge, Tedworth, and Savernake Forest, invest the place with charms which but few possess.

The work of restoration was commenced in February last. The new building presents a façade of about 110 ft. by 56 ft. in depth. The reception-rooms, which are all on the ground-floor, are spacious and conveniently placed on each side of a corridor, 8 ft. wide, extending the full length of the building, and comprise dining-room, large and small drawing-rooms, library, morning-room, study, business-room, lavatory and gentlemen's water-closet, housekeeper's-room, butler's pantry, back stairs, brushing-room, lamp-room, &c. The entrance-hall is in the centre of the façade; it is entered from a portico, having an inner lobby and screen, and is shut off from the corridor by an elliptic-headed screen, in three bays, the side bays being filled in with panelled and moulded framing to agree with that in the hall. The principal staircase, which is of oak, having a panelled oak dado and soffits, with carved and moulded newels, is in the rear of the entrance-hall. The hall is open to the roof, is finished with a richly-panelled and coved ceiling, and is lighted from the roof, in addition to windows on the landings. The principal rooms, corridor, and staircase have panelled and moulded dados, and the large bay windows in the dining and drawing rooms are finished with pilasters and panelled and moulded elliptic arches. The chimney-pieces are specially designed, those for the principal rooms being of an elaborate character, and the ornamental ceilings of these rooms are being executed in fibrous plaster by Messrs. Jackson. The family and guests' bed-rooms, bath-rooms, water-closets, housemaids' closets, upper servants' rooms, &c., are on the first-floor, and the bachelors' bed-rooms are placed in the attics. The works have been carried out with great energy and despatch by Mr. Stanley G. Bird, of Upper George-street, Edgware-road, under the direction of Mr. John Birch, architect, of John-street, Adelphi.

UNIVERSITY COLLEGE, BRISTOL

WE would direct the attention of our readers to the prospectus of this college, which has been published in our advertising columns. It will be seen that, like the similar colleges at Manchester, Leeds, Birmingham, &c., the lectures comprise all the branches of a liberal and scientific education. The erection of new buildings, which will be completed before the close of the current year, will give increased facilities for the study of science. The chemical department now contains accommodation for nearly fifty students, and is thoroughly equipped with the latest improvements for teaching which are in use in this country or on the Continent. Lectures are delivered on pure chemistry, as well as on certain branches of applied chemistry. The physical and engineering departments are also provided with facilities for laboratory work. A special feature of the engineering department is the arrangement by which students attending lectures at the college during the six winter months are enabled to gain practical experience during the summer months, when they work as pupils in the offices and workshops of leading engineering firms in the neighbourhood. The instruction in experimental physics is kept abreast of the rapidly-increasing requirements of the age, and arrangements are now perfected for the thorough training of students as electric engineers,—a profession for which the recent development of electric discovery opens good prospects.

CASES UNDER BUILDING ACT.

FLUES.

AT Hammersmith, Frederick Davis, a bellhanger, was summoned by Mr. Knightley, the District Surveyor of Hammersmith, for cutting away a portion of a flue contrary to the rules of the Building Act. Mr. Knightley said that on the 25th ult. he went to Bute House, Brook-green, and found, on removing the skirting-board near the chimney-piece, that a vertical chase had been cut in the plaster to admit the tube for the wire for the bell. It was a very important matter, as he found that workmen often destroyed the plaster and so endangered the safety of the fabric. He would be satisfied with a nominal penalty, in order to show workmen that it could not be done with impunity. In the present case the external "rendering" or plastering had been cut down to the brickwork, which was left exposed. In the event of the sweep's brush passing through the flue and rubbing off the mortar, the house would be endangered. The defendant denied interfering with the plaster, and said it was all right when he left it.

Mr. T. Chamberlain, the builder, was called by the defendant, and he stated that Mr. Knightley was correct to a certain extent, but he submitted that the Act did not apply to the case, and that he ought to have proceeded in another way.

Mr. Knightley referred to the rules, and contended that the act done amounted to the cutting away of a portion of the flue, which the Act prohibited.

Mr. Paget thought the Act did apply, and fined the defendant 5s., with 2s. costs.

VARIATIONS IN DEATH-RATE OF CERTAIN LARGE TOWNS.

	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1870 to 1875.	1875 to 1881.	Difference.
Birmingham	97·0	105·5	97·5	105·1	113·5	112·0	95·8	101·7	107·6	93·3	87·3	84·4	105·1	94·9	10·2
Brighton ...	116·7	110·5	102·4	91·7	97·1	107·3	96·1	92·2	104·4	93·7	97·1	93·1	104·3	95·7	8·6
Liverpool ...	114·9	122·6	94·8	90·2	111·8	95·8	96·2	91·6	101·7	93·7	94·4	93.0	105·0	95·0	10·0
Manchester	103·1	107·9	99·0	103·8	105·2	103·4	100·7	98·3	100·7	97·6	92·8	87·9	103·7	96·3	7·4
Salford	94·3	111·4	92·4	101·9	100·8	104·8	116·3	96·5	99·0	97·6	102·3	82·6	100·9	99·1	1·8
Sheffield ...	106·2	113·3	104·2	103·0	107·3	99·4	97·0	92·2	106·2	91·4	91·4	84·4	105·5	94·5	11·0

SIR,—In reference to the recent discussion as to the death-rate of certain English towns, I was led to calculate the above table.

The mean death-rate of each town by itself for the whole period is put equal to 100, and the yearly death-rate then calculated as a percentage on that basis.

The table would, therefore, read thus:—In 1870 the Birmingham rate was 97 per cent. of the twelve years' mean, but next year it rose to 105·5 per cent., falling again in 1873 to about the rate of 1870. At the end of the table the years are grouped in two periods of six years each, and we find, taking the average of the first period, the Birmingham rate was exactly the same as it had been in 1873; when the second period is, however, taken, the average of the six years is less than at any time during the first period. The difference between the two periods is expressed in the last column, showing that the rate has been reduced in every case; the amount, however, varying considerably, the basis of calculation being throughout the twelve years' mean of each town by itself.

The population of these towns varies so much, and with regard to Manchester an actual decrease has taken place in the time covered by the table, that in the following table the population of the smallest town and its "difference" are each put equal to 100, and the others reckoned as percentages:—

	Population. 1871.	1881.	Improvement.
Birmingham	371·8	371·9	118·6
Brighton ...	100·0	100·0	100·0
Liverpool ..	423·8	513·6	116·3
Manchester	379·8	317·6	86·0
Salford	135·0	167·1	20·9
Sheffield.....	259·5	264·5	127·9

Thus we see that Liverpool, though containing more than five times the population of Brighton, shows a rate of improvement somewhat higher, and not much less than six times the rate of improvement in Salford.

OWEN ROE.

COMPETITIONS.

Walsall Public Buildings, Bloxwich.—At a meeting of the Walsall Town Council on the 4th inst., out of the plans submitted by four architects for the proposed public buildings at Bloxwich, comprising police-station, reading-room, and stabling and cart-sheds for the sanitary department, the General Purposes Committee submitted for the decision of the council those prepared by Mr. S. Loxton and Mr. F. E. F. Bailey respectively, each set being within the settled cost of 1,200*l.* Alderman Lindop proposed, and Councillor Beebee seconded, the adoption of Mr. Loxton's plans. Alderman Brewer expressed his preference for Mr. Bailey's, but declined to move an amendment, and eventually the proposition was carried, ten members voting in its favour.

The Wallace and Bruce Memorial, Edinburgh.—The members of the Treasurer's Sub-Committee on Properties, of the Edinburgh Town Council, met on the 8th inst., in the Waverley-market, for the purpose of inspecting a number of competitive designs for the memorial to Wallace and Bruce, proposed to be erected with a sum of money bequeathed to the Corporation by the late Captain Hugh Reid for the purpose. Captain Reid's will (according to the *Scotsman*) provided that 1,000*l.* should be placed at interest in the Royal Bank of Scotland, which interest was to be paid to the testator's widow during her lifetime, after which the principal and interest should accumulate as a fund for twenty-five years, to assist in erecting some memorial to the two national heroes. The will further suggested that the monument should take the shape of "an ornamental piece of water in the North Loch, with a fountain in the centre, and colossal statues in bronze of each hero in conference." The stipulated twenty-five years posterior to Mrs. Reid's death having elapsed, the Corporation intimated that they desired to receive, in open competition, designs of the figures for the memorial, and among the conditions imposed on the competitors were the following:—That the sum to be allowed for the completed work shall be 2,000*l.*; that the competitors whose designs are second and third in order of merit shall receive, out of the city's common good, premiums of 30*l.* and 15*l.* respectively; but in the event of no design being accepted, no premium will be awarded; that the figures of the memorial shall be colossal, not less than 12 ft. in height, and that those in the competitive models shall be of the uniform height of 3 ft.; and that, while following generally the indications given by Captain Hugh Reid as to the site and character of the memorial, the treatment of the designs in detail, as well as the suggestion of the most suitable site within the locality indicated by the terms of the bequest, shall be left to the discretion of the competitors. Seven sets of figures have been put forward for competition, and, while varying considerably in style and in merit, the majority are creditable pieces of sculpture. In most cases the warriors are represented as clad in mail and armed, the Knight of Elderslie with his famous double-handed sword, and his compatriot with the short battle-axe wielded with such deadly effect against the English knight at Bannockburn. Meanwhile, the names of the respective artists have not been disclosed, the models being merely distinguished by numbers and mottoes. After the committee had inspected the designs, it was decided to adjourn the meeting without coming to a decision, and to invite the members of the Council to make an inspection and express an opinion regarding the merit of the several designs.

The West Cumberland Liberal Association, Workington Branch.—The committee having advertised for plans for buildings comprising a large hall to seat 2,500 people, a club-house, a post-office, shop, and offices, the designs sent in by Mr. T. Lewis Banks, of 23, Finsbury-circus, London, and Whitehaven, have been selected.

STONE-DRESSING BY STEAM POWER.

ACCORDING to the *Baugewerkszeitung*, the use of facing stones of terra-cotta will, in future, experience the competition of natural stone dressed by steam power. The new invention of Herr Schmidt has apparently been proved by trials to combine simplicity of mechanical arrangement with economical and rapid working. Former attempts in this direction have been based on the idea of imitating stone-dressing by hand, and the machinery has been devised for the purpose of producing a smooth surface by the removal of all uneven portions; but Herr Schmidt has worked on a different plan. He has applied the principle of a saw with as great a power as can be obtained, to the production, at the same time, of two surfaces ready for use. The inventor seems to have been, to some extent, influenced by the stone-boring machine, which was the means of accomplishing the gigantic tunnelling works of St. Gothard and Mont Cenis. He seems to have reasoned, that by the judicious application of the principle of this machine it ought to be a matter of no insuperable difficulty to produce a stone-dressing machine able to supersede manual labour.

A provisional machine, of limited size, was constructed, in which a small steam cylinder imparted a vertical striking motion to a pair of steel chisels of equal width. A stream of water was used in conjunction with this appliance, and as the chisels penetrated the block of stone, two regular and even surfaces were produced. This trial was made with the hardest syenite granite.

An ordinary stone-dresser, working with a hand saw, can produce in a day of eleven hours, according to the journal named:—

Square feet of cut surface.	
4·30 to 6·45	in sandstone.
1·82 to 2·15	in marble.
0·21 to 0·32	in granite.

The smallest machine on Herr Schmidt's principle, with one small steam cylinder, can produce in the same time 43 to 65 square feet of cut surface of granite, and, therefore, represents the daily labour of 200 workmen. It is the same thing to the machine whether hard granite or soft sandstone is given to it to cut, but the quantity of work done varies, of course, according to the hardness of the material. The machine is, therefore, a reliable test of the exact comparative hardness of various descriptions of stone.

The piston only requires a limited stroke of 1½ in. to 2 in., and gives about 1,000 blows per minute without the chisels heating, as a continuous stream of water serves the double purpose of keeping them cool and of carrying away the minute particles of stone, &c., which are constantly accumulating. This is a considerable gain to the workmen from a sanitary point of view, as there is no stone dust thrown off. There is provision made for the stone dust being deposited by the water which flows away, in such a manner that it can be easily removed. It is used in the ceramic industry, and is, therefore, of some value.

The inventor delayed bringing his machine in a prominent manner before the industrial public until it had been subjected to the most difficult tests.

SEWERAGE AND DRAINAGE WORKS.

Nottingham.—At the meeting of the Nottingham Town Council on the 4th inst., the Beck Valley Sewer Joint Committee reported to the council as to the scheme for dealing with the storm waters in the Beck Valley district as follows:—The committee report that, pursuant to the order of the Town Council made on the 3rd day of April, 1882, they have again seriously considered the question of providing for the carrying away of the storm waters in the above district. The committee having had before them the particulars of the rainfalls which have occurred during the past summer, are compelled to come to the conclusion that some scheme for dealing with the floods should be carried out without further delay. Your committee refer the council to their previous report on this matter, dated March 1st, 1882, in which it was stated that a scheme for dealing with 1 in. of rainfall per hour would cost about 32,000*l.*, and that a scheme for dealing with 2·8 in. per hour would necessitate an additional outlay of only 9,000*l.* Considering that by the expenditure of the extra 9,000*l.* nearly three times the amount of rainfall would be carried off, your committee feel bound to recommend the council to carry out the scheme capable of dealing with the largest recorded rainfall of the district, which is estimated to cost about 41,000*l.* During the illness of the borough engineer, your committee called in the advice of Mr. Tarbotton, and asked him to report generally on the whole scheme. He has reported to your committee, and has also made a thorough inspection of the line of route in company with the borough engineer. Your committee, having fully considered the matter, recommend the council to adopt the scheme drawn up by the borough engineer, the plans of which are now laid before the council, and that your committee be authorised to carry out such scheme at a cost of 41,000*l.* The report was adopted.

Burton-on-Trent.—At a meeting of the Burton Town Council on the 6th inst., the Highways and Sewers Committee recommended that the giving of notices to treat for the land scheduled in the provisional order for the works of sewage disposal be deferred for the present, and that Mr. E. Daniels, of Needwood-street, should be appointed clerk of works in respect of the construction of the engines, boilers, &c., for the sewage works. In moving the adoption of the report, the Mayor referred to the question of the drainage of Stapenhill and Winshill. The matter had not been neglected since the last meeting, but the committee had given it consideration, and had devoted considerable time to the inspection of the most difficult places. As to the lands required for sewage works, the committee recommended that the Estates and General Purposes Committee should proceed

with the purchase of the 300 acres for which they obtained an Act of Parliament, and that the purchase of the additional land for which they obtained a provisional order should stand over for a time. From a letter which they had received from Mr. Mansergh, the engineer, it appeared that 300 acres would be as much as he could deal with for some time, and they thought it was desirable they should wait to see how things turned out before they proceeded further. Alderman Wardle said he could not vote in favour of the report as it stood with reference to the taking of land for sewage works. The committee had come to the determination that some 450 acres (he forgot the exact figures) were absolutely necessary for the work, and he argued that it would be more economical to secure the whole of that area at once. The report was, however, agreed to.

Shirley (near Southampton).—At the meeting of the Shirley and Freemantle Local Board of Health, on the 6th inst., a letter was read stating that Lady Mill would not sell the land required by the Board for the proposed sewerage works on any terms, and that every means would be taken to oppose the acquisition. The chairman (Major-General Lewis) said the only way, then, to get possession of the land was by exercising compulsory powers. They could not do anything yet until they had plans of the proposed works, and until the scheme was sanctioned by the Local Government Board, and then they could take the necessary steps to get possession of the land. Subsequently the Chairman stated that Dr. Sampson and himself, who were appointed as a deputation to Hertford to see the sewage works, went there on the 19th ult., and they had drawn up a report which had been submitted to the Sewage Scheme Committee. He might mention that they were of opinion that the process in use there was an efficient one, the chemical agents being crude sulphate of alumina, copperas, and lime. Whether the system would be adapted to the Shirley and Freemantle district would be dependent upon the cost at which these materials could be procured. With Dr. Sampson, he (the chairman) was of opinion, provided they could procure them at a reasonable cost,—and they would require at Shirley a lower degree of purity than at Hertford,—that the process would suit the Board very well. On the proposition of Mr. Stewart, seconded by Mr. Inder, it was decided to leave the matter in the hands of the Sewage Committee to find out the cost of the alumina, and to get the Engineer to the Rivers Purification Association to report on the subject.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,219. J. B. Shaw, Tunstall. Decorating bricks, &c. Sept. 5, 1882.

4,232. J. Hudson, Bolton. Apparatus for holding and releasing cords for venetian blinds, &c. Sept. 6, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named :—

Sept. 5, 1882.

2,097. R. Guelton, Brighton. Producing artificial marbles, &c. May 4, 1882.

2,120. W. McGill, London. Urinals, &c. May 5, 1882.

Sept. 8, 1882.

2,121. T. W. Helliwell, Brighouse. Water-closet basins and means of flushing the same. May 5, 1882.

2,209. L. J. J. Kelly, London, and C. B. Lindsay, Blackheath. Graining and ornamenting surfaces. May 10, 1882.

3,614. T. Hyatt, London. Illuminating gratings, &c. July 31, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending Sept. 9, 1882.

424. M. Ingram, Manchester. Apparatus for preventing waste of water from lavatories and baths. Jan. 27, 1882. Price 2d.

A three-way tap is used on the water-supply pipe, which first fills a receiver of the required size, and when the tap is turned to fill the bath, &c., no more water will enter the receiver. (*Pro. Pro.*)

437. J. Imray, London. Effecting fireproof separation of the stage and proscenium in theatres. (Com. by K. Pfaff, Vienna.) Jan. 28, 1882. Price 4d.

The curtain consists of horizontal strips of sheet iron bent to a curved shape, the concave sides of which are towards the proscenium. These are riveted together, and the lateral edges are supported by vertical bands. This curtain travels in a wide groove. (*Pro. Pro.*)

468. E. Wilkins, London. Apparatus for sustaining sliding window-sashes, &c. Jan. 31, 1882. Price 2d.

In each side of the frame is a recess, in which is pivoted a tongue-piece kept projecting towards the sash by an indiarubber pad. Above this is a roller which, when the sash commences to fall, jams in between the tongue and the side of the sash, which is thereby sustained. (*Pro. Pro.*)

469. J. Parkinson, Caton. Boilers and furnaces for heating greenhouses, &c. Jan. 31, 1882. Price 6d.

These have water-spaces all round, both sides, front, back, and top. Above the crown of the fire-box are three arched water-shelves alternately connected to the front and back water spaces, so that the products of combustion pass backwards and forwards between them on their way to the chimney. The flow-pipe passes vertically through and communicates with the centre of each of these water spaces.

482. E. R. Wethered, Woolwich. Latches and locks. Jan. 31, 1882. Price 6d.

A weighted lever handle is used to project the bolt forward. A notch is formed in the bolt, in which a stud engages when the bolt is withdrawn, and when the door is shut the fore-end of the bolt is lifted by an incline on the sticking-plate, which frees it of this stud, and the handle presses forward the bolt.

544. G. Otway, Brixton. Apparatus for cutting or dividing bricks, tiles, or slabs from plastic clay. Feb. 4, 1882. Price 8d.

The stream of clay is cut as it passes on to the cutting-table into the exact lengths required to form a certain number of bricks. This is effected by a rack with two sets of teeth, to which the pusher is attached, which slides in a pair of parallel guides. The rack is set to the required length, and pushes the required quantity of clay beneath the guillotine.

2,302. J. Mitchell, Paris. Manufacture of decorative transparencies for windows, &c. May 16, 1882. Price 2d.

These are made of thin sheet gelatine of different colours. The several pieces are joined together by strips of dark coloured paper attached thereto by glue, &c.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street.

"WHAT IS PROPORTION?"

SIR,—It is essential in discussions of this kind that the words used should have a precise value, a definite meaning. When it is said that a work is proportioned, it is meant that it is well "proportioned"; but the word "proportioned," connoted with the prefix badly, is also applied to the unsymmetrical both in nature and in art. "Symmetrical" is probably the word which ought to be used for the æsthetically or beautifully proportioned; this word, however, is unfortunately generally misapplied, in discussions on architectural matters, to balanced repetition on either side of a medial line, as observed in the features of the human figure, and to regularity in geometrical configuration. Everything in existence is either well proportioned or ill proportioned, *i.e.*, exists in either right or wrong quantitative relation. It is idle, therefore, for any one to talk or write upon the subject of proportion who has not conceived it mathematically.

Before the subject of proportion can be firmly grasped, we must be able to clearly discriminate between æsthetic proportion and proportion in relation to constructive fitness. The science of æsthetic proportion treats only of those proportions which, quite irrespective of any other purpose, are opposite to taste. The adaptation of proportion to taste is a distinct section of study, which may be pursued abstractly and independently of any consideration touching the conformity of proportion to any other end. In fact, the adaptation of proportion to constructive purposes is ruled by quite other considerations, by the necessities of the case, and cannot be formulated as a science. Æsthetic proportion, however, is founded on human experience as to what proportions, in the combinations of forms, colours, and musical notes, are apposite to taste, to the senses of sight and of hearing; and not upon any vague *à priori* notion that some ratio $a : b$ is a beautiful ratio. Half-educated persons in these matters would appear to think that to call proportions either mathematical or geometrical must necessarily determine them to be beautiful; why, every quantitative relation, every proportion, good, bad, or indifferent, is mathematical, and every configuration of surface, and every form of solidity, is geometrical. In the course of my studies connected with the subject of proportion in general, I have formulated the science of æsthetic proportion, and have demonstrated that the music of form, colour, and sound are based upon identical quantitative relations; that the same ratios which are apposite to the ear are also apposite to the eye. I have shown, moreover, that there is a corresponding effect produced by the same combinations of ratios on the auditory and optical senses,—possibly on all the senses.

Proportion in the concrete, or in reference to constructive fitness, is quite another consideration. Neither on *à priori* nor on æsthetic grounds could the proportions of either a column or a doorway be determined. The proportions of these may be decided by reference to some constructive end; by the Greeks it was probably determined by reference to human proportions, for the column of 8 : 1, with interval of 4 : 1, conforms to the general proportions of typal human form, sideways and full front. The interval of 4 : 1 is, therefore, a consistent ratio for an intercolumniation, for an entrance, a doorway. There is a tradition, indeed, that the variations in the proportions of the column and its interval, in Greek architecture, were decided by reference to certain characteristic human proportions. The proportions of either a factory chimney or of a steam-engine are not determined by any æsthetic considerations, but by constructive necessities; and this is why constructive fitness of proportion is not necessarily beautiful; rigorous constructive fitness of proportion commends itself to the judgment rather than to taste. But the proportions which are adapted to a constructive purpose may sometimes coincide with proportions which are apposite to sense, to taste; as, for instance, those of the perfect human form, the egg-shape, &c. Although we all know perfectly well that the horse, the gazelle, the leopard, the hippopotamus, the elephant, and the toad, are all equally admirably proportioned to their several ends, no one would be able to convince us that their forms are all equally agreeable and apposite to the sense of sight. Sensitive æsthetes will often insist that the ugliness of constructive fitness should be garnished by something beautiful, *appliqué*, which appears to me about as reasonable as it would be to insist that the hippopotamus should be made pretty.

There can be no doubt that the general effect which a building or a chamber makes upon us may to some extent be dated from ourselves, from the relative magnitude of the observer to the building, just as we are differently affected by the magnitudes of hill and mountain, the different scale of natural scenery, in comparison with our own dimensions.

W. CAVE THOMAS.

STAINED GLASS.

Debden.—The east window in the chancel of the parish church at Debden, near Saffron Walden, has just been filled with stained glass. It is a three-light window, and has "The Crucifixion" forming one subject, running through the three openings, the background being a deep ruby, panelled upon a foliated ground of roses and carefully-drawn foliage. The tracery of the window is filled with weeping angels, and the bases of the lights with appropriate symbols of the pelican feeding its young, and the Alpha and Omega. The window is the gift of Mr. R. S. N. Barthropp, to the Vicar, and is the work of Messrs. Gibbs & Howard, of London.

Handborough.—An improvement has just been effected in the church at Handborough, by the filling of the three-light east and west windows with Munich stained glass, by Mayer & Co. The former represents the angel appearing to the women at the sepulchre, and the latter contains rich and chaste ornamental designs. The whole has been erected in memory of the wife of the Rev. R. P. Newhouse.

Miscellanea.

Railway Plant for Victoria.—It is stated that the Government of Victoria, Australia, have just placed a further order for 30,000 tons steel rails and fish-plates. Competition was very severe between English and Continental manufacturers, but the *Ironmonger* states the order was secured for Belgium through De Paula & Co., London. The foreign houses were able to compete on close terms for the extended deliveries specified in this instance.

Maidstone Local Board.—Mr. Anscomb, C.E., who has held the appointment of Borough Surveyor of Maidstone for upwards of eight years, has resigned the appointment in favour of private practice.

The Latest Excavations at Pompeii.—The Naples correspondent of the *Daily News* writes:—"The last house excavated at Pompeii in Isola V., Regione VIII., is of an anomalous kind. It is situated at the south side of the isola. Its construction is quite unusual, as it possesses no proper atrium. On entering the doorway you find on your right a small stove in the corner of the passage, and on the left is the kitchen proper, with a room for slaves. Then to the right is a row of columns, forming a rectangular space, in the midst of which is the triclinium, with the reclining bed formed of masonry, and in the centre a cylindrical table covered with slabs of marble geometrically arranged. The wall-paintings of this open space are not of great value: there are heads of Medusa, hypographs, and fantastic birds. Returning into the passage, there is on the left next to the kitchen an exedra, with walls ornamented with white and yellow squares, divided by columns, decorations, and festoons, all in fresco. At the entrance of this room are two strange figures; on the left, an infant surprised at the sight of a large rat issuing from a trap, and on the right the same infant trying to catch the rat. On the left wall is a medallion with a small figure, two Cupids and two flying geniuses, one with a pastoral staff in the left hand, and a bunch of grapes in the right; the other with a staff in the right hand, and the left supporting a basket on the shoulder. The opposite wall is in a bad condition, so that nothing can be distinguished but the faint traces of a similar medallion. This room was covered, and above it and the kitchen was a second story, to which access was had by a staircase at the end of the ground-floor passage, and by a similar passage above. Behind the exedra (always to the left of the passage) comes an enclosed garden. A window into this garden gave light to the staircase. At the extreme end to the right is another small room, with a window opening into the triclinium. This room had another above it, and the sole connexion between this upper room with the others on the left was by means of the passage on the second floor. Many vases, shells in bronze, several gold rings with engraved stones, and amphoræ, were found in this house, and six skeletons. A walled-up door on the left wall of the exedra makes it probable that the house was once a portion of some other larger dwelling, and that it, like so many others, had been sold separately, and undergone various changes."

The Drainage of Cannes.—M. Gazagnaire, the mayor of Cannes, sends to the *Morning Post* some information as to the sanitary works now being carried out in that town:—He says the contract for one portion was taken on the 17th of August, and the works were begun on the 21st. This portion consists of, first, the sewer of the Boulevard de la Croisette from the Rue d'Oustinoff to a large receiving sewer which already exists; and, secondly, the portion of the Rue d'Antibes from the passage on the level to the Boulevard de la Croisette, running by the Rue d'Oustinoff and the Rue Duboys d'Angers. The system of sewers will need three contracts for its entire completion. According to the scheme, the flow from the sewers will be conducted to a point, say the mole of the port, where an elevating-machine will raise and empty them into the Gulf of Napoule, near the opening of the Canal de la Siagne at the Trou de l'Ancre, where the depth is from eight to ten fathoms, and there are currents which will carry everything away into the open sea. The authorities are also engaged in elaborating a plan for the complete drainage of the low-lying grounds. This will be commenced with Chataignier.

An Appointment at Swansea.—A correspondent writes to say that in our issue of August 5th there appeared an advertisement for an Estate Superintendent under the Swansea Town Council. The advertisement stated that applications were to be sent in "not later than the 7th prox." On the 6th inst., our correspondent sent in an application, together with testimonials, and by return of post had them returned, accompanied by a letter from the Town Clerk (dated Swansea, September 7th), stating that the application came too late, as "the selection had been made"; and further stating that "the appointment would be made early in the following week." Some further explanation appears to be needed.

Another Theatre Burnt Down.—The Beriot Theatre at Louvain was destroyed by fire on the 11th inst. No lives were lost.

The Value of Sunshine has been strikingly exemplified since the 4th of August, when it may be said the summer commenced. It has arrested the progress of potato disease, rendered the harvesting of grain possible, and made a fair finish of the hay crop in the late districts. Still more strikingly has the influence of solar light on vegetation been displayed in the flower garden, for with the brighter days there came a perfect flood of flowers; and yet the sunny days have been divided by chilly nights, and the thermometer has on several occasions very nearly touched the freezing point. But tender plants seem able to endure without harm a temperature lower than we should dare to subject them to by intention, provided they are well-established in the ground, and are brought to their full development in a dry healthy air under continuous sunshine. We cannot make sunshine, but we may, and must, take note of its action with a view to accommodate all our out-door work to the necessity that is so amply demonstrated. When we plant strawberries on terraces, and potatoes on ridges, and stone fruits on walls, we are complying with the direct teachings of nature in respect to the powers of solar light, and it may be that we have much yet to learn as to the utmost advantageous appropriation of a power that we can never influence directly, and to only a small extent indirectly. As regards the possibility of indirect influence, we have but to compare the country with the town. In the country the light is strong and pure, and vegetation rejoices in it; in the town it is weak and impure, because we have ourselves loaded the air with smoke and dust, and the adulterated sunshine produces a weaker plant and a weaker man than that of the open country, where there are no fumes from chimneys, and no unwholesome exhalations from sewers and rubbish heaps, which are equally obstructive of sunlight and poisonous to all forms of animal and vegetable life.—*Gardener's Magazine.*

Fire at a Builder's.—Between ten and eleven o'clock on Sunday morning a fire broke out on the premises of Messrs. Ashby Brothers, builders, No. 24, Bishopsgate-street. The property is approached by a gateway next to the fire-brigade station, and runs some distance back, abutting on the rear of the houses in Devonshire-square. The firemen were the first to discover the fire burning in one of the upper workshops, and the hose was instantly brought out of the station and attached to a street hydrant, whence a good supply of water was obtainable; but the flames developed themselves rapidly. Other engines were brought to the scene. The superintendent's report represents the damage occasioned as follows:—"A brick and timber building, of three floors, about 45 ft. by 30 ft. (used as workshops and stores), second floor and contents burned out, and roof off; rest of building and contents and stock in open yard severely damaged by fire and water." We understand that Messrs. Ashby Bros. have also premises in the Kingsland-road, which will enable them to carry on their business with less difficulty than they would otherwise experience.

Beneficial Results of Sanitary Measures.—On the 7th inst. the eighth annual meeting of the Sanitary Association of Scotland took place in Greenock. Mr. Mackay, Sanitary Inspector, gave an interesting sketch of sanitary progress in Greenock. He said that when, in 1876, the local authorities got Parliamentary powers for carrying out a scheme of town improvement in many closes in the lower part of the town, the mortality averaged from 40 to 57 per 1,000, while the general mortality was higher than in any other town in Scotland. Between 1855 and 1875, the mean death-rate was 30·24; while for the five years ending 1880, since stringent regulations had been adopted, it was 24 per 1,000.

The De Lank Granite Quarries, now called the Eddystone Granite Quarries, are in full work again, the proprietor, Mr. Shearer, having secured from the Trinity House contracts for the supply of granite for the Bishop's Rock Lighthouse, and from the Admiralty for a dock at Haulbowline, in addition to other large works in hand. The fact that these quarries supplied the stone for the new Eddystone Tower in six months less than the contract time testifies to their capabilities.

Chard Parish Church.—The restoration of the parish church of Chard, in Somerset, at an estimated cost of 5,000*l.*, has been commenced.

"The Wall that Jack Built."—The correspondent of the *Standard* at Alexandria gives the following account of the cutting which is being made through the sand-hills between the sea and Lake Mareotis:—It is intended to raise the level of the lake and so flood a wide tract of sand, now dry, so as to form a protection to our right flank. A large body of natives were at work deepening the moat under the western walls of the fort, while at each end working parties of blue jackets from the *Inconstant*, under Lieutenant Scott, were engaged in blasting the dams. In three days the indefatigable sailors have built up a wall 4 ft. high, 12 ft. broad, and nearly 200 yards long, to prevent the inflowing water from wasting itself in the western section of the lake beyond the disused railway embankment, which has also been pierced to allow the passage of the water into the eastern section. The work is now nearly complete, and this morning the tars erected a triumphant placard, "H.M.S. *Inconstant*. This is the wall that Jack built."

Burnley.—On the 2nd inst., the memorial-stones of a school-chapel, to be erected in Hufting-lane, Burnley, for the Wesleyan denomination, were laid by the mayor (Alderman Fielding), the ex-mayor (Alderman Howorth), Mr. John Butterworth, J.P., and Miss Butterworth. The building will consist of a large room, to seat about 300 persons, and four class-rooms, and is estimated to cost about 1,500*l.*, towards which sum 1,000*l.* has already been raised. It is the design of, and will be completed under the supervision of, Messrs. Waddington & Sons, architects, Burnley. Land has been taken for the erection of a chapel adjoining the proposed building, to be erected when required.

New Assembly Rooms, adjoining the King's Arms Hotel, Wood-green, were opened last week, and a want long felt in the neighbourhood has been supplied by Mr. Greenslade. The room itself, 73 ft. long by 35 ft. wide and 19 ft. high, will seat comfortably 750 persons, and has cloak and retiring rooms attached. The approach is by a wide stone staircase, and the rooms are lighted by sun-burners, special attention having been given to the ventilation. Mr. Henry Stone is the architect, Mr. John Bell the contractor, whilst Mr. Cawdron acted as clerk of works.

New Workhouse Schools, Oldham.—The premiums in this competition have been thus awarded by the Guardians:—First (50*l.*), Mr. Thomas Mitchell (motto, "Charity"); second (30*l.*), Messrs. Wild & Collinge ("Oliver Twist"); third (20*l.*), Mr. Alexander Banks ("A.R.A."). All the competitors are Oldham practitioners. The other competitors received a vote of thanks as a "consolation prize."

Darlington.—New printing and publishing offices are about to be erected in Crown and Quebec streets, Darlington, for the Northern Counties Constitutional Newspaper Company (Limited), from the designs of Mr. G. G. Hoskins, architect, of that town.

TENDERS

For the erection of five houses at Lavender-hill, for Mr. Sydney J. Stern. Mr. B. T. L. Thomson, architect. Quantities supplied:—

	Specification No. 1.	Specification No. 2.
Bowes	£6,348	£5,659
Harverson	6,106	5,546
Ellis	5,863	5,159
Laing & Son	5,790	5,266
Lathey Bros.	5,582	4,964
Turtle & Appleton	5,475	4,880
Johnson	5,364	4,869
Holloway Bros.	5,243	4,724
G. Ugle	4,994	4,420

For the erection of a new Railway Hotel, at Newbury, Berks, for Mr. E. H. Morland. Messrs. Winship & Harrison, architects, Abingdon, Berks. Quantities supplied:—

H. Potter & Sons	£995	0	0
Harrison	961	9	0
Deacon	878	8	4
Hedge	807	6	2
Williams (accepted)	772	0	0

For pulling down and rebuilding the Bedford Arms public-house, Dawes-road, Fulham, for Mr. T. P. Davis, Walham-green. Mr. William Bradford, Carlton-chambers, Regent-street, architect. Quantities by Messrs. J. & A. E. Bull, 35, Craven-street, Strand:—

T. H. Adamson & Son, Putney	£2,225	0	0
Higgs & Hill, South Lambeth	2,190	0	0
J. McLachlan & Sons, Clapham	2,134	0	0
G. H. & A. Bywaters, Regent-street	1,985	0	0
W. H. Smith, Walham-green	1,900	0	0
Patman & Fotheringham, Theobald's-road	1,866	0	0

For the erection of Board Schools to accommodate 850 children, at Blaina, Mon., for the Aberystwith School Board. Mr. W. D. Blessley, architect, 22, Trinity-street, Cardiff:—

School Building.

S. Shepton	£6,210	0	0
J. Clarke	5,493	0	0
Thomas Watkins & Jenkins	5,400	0	0
H. Welsh	5,400	0	0
H. Parfitt	5,400	0	0
W. McGaul	5,265	0	0
D. Davies	4,990	0	0
Coleman Bros.	4,920	0	0
Jones & Son	4,773	0	0
Bowers & Co.	4,770	0	0
Thos. White	4,550	0	0
J. Jenkins, Brynmaur (accepted)	4,450	0	0
H. C. Forse	4,193	0	0

Preparing Site, Boundary Walls, &c.

H. Parfitt	£1,370	0	0!
H. Welsh	1,280	0	0
S. Shepton	1,273	0	0
Thomas Watkins & Jenkins	1,220	0	0
D. Davies	1,210	0	0
W. McGaul	1,139	0	0
Coleman Bros.	1,110	0	0
Bowers & Co.	1,100	0	0
Jones & Son	1,045	0	0
Thos. White	1,000	0	0
H. G. Forse	950	0	0
J. Clarke	990	0	0
J. Jenkins, Brynmaur (accepted)	690	0	0!

Strengthening Walls with Hoop Iron and White's Patent Compo.

S. Shepton	£452	15	0!
Thomas Watkins & Jenkins	400	0	0
H. G. Forse	287	0	0
H. Welsh	280	0	0
Bowers & Co.	280	0	0
J. Clarke	249	0	0
Thos. White	249	0	0
W. McGaull	247	17	7
H. Parfitt	240	0	0
D. Davies	240	0	0
Jones & Son	239	0	0
Coleman Bros.	225	0	0
J. Jenkins, Brynmaur (accepted)	108	0	0!

Board Room, &c.

H. Welsh	£874	0	0
S. Shepton	865	0	0
W. McGaul	800	0	0
H. Parfitt	790	0	0
D. Davies	790	0	0
Thos. White	780	0	0
H. G. Forse	780	0	0
Bowers & Co.	750	0	0
Thomas Watkins & Jenkins	750	0	0
Jones & Son	740	0	0
Coleman Bros.	740	0	0
J. Clarke	582	0	0
J. Jenkins, Brynmaur (accepted)	456	0	0

For new counter and fittings at the King's Head, Ebury Bridge, Pimlico, for Mr. J. Ditton. Mr. Charles Jones, architect, 151, Ebury-street:—

Buckley & Beach	£162	0	0
Louth	138	0	0
Helling	136	0	0
Rogers	135	0	0
Watts	124	7	0
Sanders & Sons	117	0	0

New Lobbies.
Taylor, Camberwell (accepted).

For alterations and repairs at the Royal Arms, Battersea Park-road, for Mr. Thomas J. Hardy. Mr. Charles Jones, architect:—

Lathey Bros.	£205	0	0
Street	198	0	0
Ashfold	196	0	0
Coulthard	189	8	0
Heath	177	0	0
Walkley	167	0	0
R. & H. Pickersgill	152	0	0

For additions and alterations at 119, Ebury-street, Pimlico, for Mr. W. Piggott. Mr. Charles Jones, architect:—

Holt & Garlick	£235	0	0
Heath	249	0	0
G. & W. Watson	244	18	0
Coulthard	240	0	0

For extension of factory, Millwall, for Mr. J. T. Morton. Under the superintendence of Mr. William Eve, 16, Union-court, Old Broad-street:—

Chafen	£2,040	0	0
Shurmur	1,790	0	0
Salt	1,743	0	0
Crabb	1,700	0	0
Harris & Wardrop,* Limehouse	1,569	0	0

* Accepted.

For warming and ventilating, by their new hydro-caloric apparatus, the second section of one wing of Greenwich Hospital Schools:—

J. Weeks & Co., Chelsea	£360	0	0

For the construction of about 1,280 ft. lineal of 9-in. stoneware pipe sewers, with manholes, lampholes, &c., in Addison-road and Cowper-road, for the Bromley Local Board. Mr. Hugh S. Cregeen, surveyor:—

James Taylor	£185	15	6
Davis & Attwood	163	10	0
Thomas Lansbury	167	0	0
E. Peill & Sons	154	10	0
John Beutley (accepted)	149	0	0

For the erection of a residence, Wetherby-road, South Kensington, for Captain W. Abney, R.E. Mr. William H. Collbran, architect, 94, Gloucester-road, South Kensington. Quantities by Messrs. Strudwick & Mennie:—

G. H. & A. Bywaters	£3,300	0	0
Higgs & Hill	3,180	0	0
A. Thorn	3,150	0	0
J. McLachlan & Sons	3,140	0	0
H. Smith	2,989	0	0
Martin, Wells, & Co.	2,900	0	0
Perry & Co.	2,830	0	0
H. Toten & Sons	2,825	0	0
Ashby Bros.	2,718	0	0
B. E. Nightingale	2,597	0	0

For the erection of ten cottages, at Broad River, Orpington, Kent. Mr. St. Pierre Harris, architect:—

Waite, Dartford	£1,800	0	0
Epsom, St. Mary Cray	1,800	0	0
A. & F. Smith, Greenwich	1,800	0	0
Marsh	1,500	0	0
Laslett, St. Paul's Cray	1,480	0	0
Lay, Bromley	1,450	0	0
Wright, Chelsfield (accepted)	1,450	0	0

For additions and alterations to residence, High-street Orpington, Kent. Mr. St. Pierre Harris, architect:—

Wood, Chislehurst	£247	0	0
Haisman, Foot's Cray	225	0	0
Treadwell (too late)	215	0	0
Taylor & Son, Bromley (accepted)	190	0	0

For additions and repairs to The Hawthorns, Bromley, Kent. Mr. St. Pierre Harris, architect:—

Payne	£275	0	0
Arnaud	253	0	0
Balding	234	0	0
Crossley (accepted)	229	10	0

For building a detached villa-residence, Anlaby-road, Hull, for Mr. Henry Allison. Mr. Robert Clamp, architect. Quantities supplied:—

G. Jackson & Son, Hull	£4,200	0	0
Habbershaw & Son, Hull	3,650	0	0
T. Goates, Hull	3,481	16	11
Sergeant, Hull	3,435	0	0
Alfred Brown, Hull	3,433	9	4
Siminson, Hull	3,351	10	5
J. & W. Stamp,* Barton-upon-Humber	3,190	7	0

* Accepted, subject to modifications.

For alterations and repairs to 21, Hertford-street, Mayfair, for Sir John Whittaker Ellis, bart. Under the superintendence of Messrs. Farebrother, Ellis, Clark, & Co. No quantities:—

Patman & Fotheringham	£1,593	0	0
J. & P. Hermon	1,397	0	0
A. G. Bolding	1,357	0	0
Burningham & Co.	1,229	0	0
Geo. Shaw	1,131	0	0

For alterations and additions to 93, Jermyn-street, St. James's, for Mrs. Welch. Mr. J. Wm. Stevens, architect. Quantities not supplied:—

Styles & Sons	£700	0	0
Holliday & Greenwood	677	0	0
Axford	558	0	0
A. G. Bolding	557	0	0
Scott	487	0	0

For alterations and additions to Nos. 26 and 27, Somerset-street, Portman-square. Messrs. J. & J. Belcher, architects. Quantities by Mr. J. E. Drower:—

Robt. Perkins	£1,157	0	0
F. W. E. Braid	988	0	0
Langmead & Way	981	0	0
W. Scrivener & Co.	981	0	0
A. G. Bolding	949	0	0
J. Holloway	925	0	0

For Branch Bank, Hereford, for the Worcester City and County Banking Company. Mr. E. H. Lingen Barker, architect:—

Taylor	£1,240	0	0
Cullis	1,200	0	0
Balcombe	1,195	0	0
Kendrick	1,191	0	0
Jones	1,112	0	0
Wood & Sons	1,097	0	0
Collins, Tewkesbury (accepted)	1,020	0	0

For assembly-room and additions, Red Lion Hotel, Colchester, for Mr. William Wilberforce Daniels. Mr. Frederick Evelyn Morris, architect:—

C. H. Oldridge, Colchester (accepted)	£2,000	0	0

For villa residences at Epsom, for Mr. W. Reeve. Mr. J. R. Harding, architect, Epsom, Surrey:—

	One Villa.			Two Villas.		
Rivers	£1,220	0	0	£2,400	0	0
Green	1,173	0	0	2,330	0	0
Hards	1,144	0	0	2,280	0	0
Payne	1,086	0	0	2,120	0	0
Potter	1,020	0	0	2,000	0	0
Keal (accepted)	950	0	0	1,850	0	0

For repairs at the Licensed Victuallers' Asylum, Old Kent-road. Mr. W. F. Potter, architect:—

L. E. Clark, Kennington (withdrawn)	£475	0	0!
W. H. Pritchard, Southwark	225	0	0
C. Dearing & Son, Islington	210	5	0
S. Hayworth, Kingsland	210	0	0
W. Wells, Paddington	190	0	0
W. Wythe, Dalston	164	10	0
F. Hersee, Peckham (accepted)	136	0	0!

For the supply of 3-in. socket water-pipes, for the Guildford Urban Sanitary Authority:—

	Per Ton.		
Reading Iron Works	£5	12	6
Mason & Weyman	5	10	0
Carling, Gill, & Carling	5	10	0
Enfield Iron Company	5	10	0
Bailey, Pegg, & Co.	5	7	6
Goodyer	5	6	0
Currington	5	2	9
Thames Iron Company	5	1	3
Noble & Co.	4	19	6
J. & S. Roberts (accepted)	4	17	6

For the erection of shops and offices, St. Mary Axe, for Mr. Peyton Dashwood. Mr. A. Croft, architect:—

Aviss & Co.	£8,790	0	0
David King & Son	7,800	0	0
Killby	7,667	0	0
Perry & Co.	7,529	0	0
Higgs & Hill	7,500	0	0
Shurmur	7,389	0	0

For alterations, 42, Cannon-street, for Messrs. Sterne & Co. Mr. John Whichcord, architect:—

David King & Son	£1,578	0	0
E. Lawrence	1,267	0	0

For building three residences at Dulwich, for Mr. Burton. Mr. Barker, architect:—
Joseph Higgs, Upper Park-place (accepted).

For the erection and completion of sheds for lairage, accommodation slaughter-houses, tripe houses, roads, &c., at the Foreign Cattle Market, Deptford, for the Worshipful the Cattle Markets Sub-Committee of the Hon. the Corporation of the City of London. Mr. Horace Jones, architect. Quantities by Nixon & Raven:—

Lovett	£36,269	0	0
Kirk & Parry	34,290	0	0
Kellett & Bentley	34,085	0	0
Chappell	33,634	0	0
Nightingale	32,983	0	0
Shaw	32,252	0	0
J. & T. Greenwood (too late)	31,000	0	0
Mowlem	29,877	0	0
Morter	29,129	0	0
Gentry	26,825	0	0

For enlarging the following schools for the West Ham School Board. Mr. J. T. Newman, architect. Quantities by Messrs. R. L. Curtis & Sons:—

Clarkson-street:—

Thurston	£5,640	0	0!
Russell	2,904	0	0
Taylor & Grist	2,490	0	0
Higgs	2,390	0	0
Jones & Co.	2,330	0	0
Nightingale	2,259	0	0
Reed	2,210	0	0
Swain	2,205	0	0
Lolargan	2,200	0	0
Hearle & Son	2,174	0	0
Gregar	2,167	0	0
Cox	2,130	0	0
North Bros.	2,125	0	0
Morter	2,087	0	0
Gentry (accepted)	2,000	0	0!

Maryland Point:—

Miller	£3,800	0	0
Higgs	3,480	0	0
Taylor & Grist	3,380	0	0
Lolargan Bros.	3,148	0	0
Russell	3,134	0	0
Swain	3,121	0	0
Jones & Co.	3,090	0	0
Nightingale	3,070	0	0
Reed	3,015	0	0
Gregar	2,979	0	0
Hearle & Son	2,972	0	0
Morter (accepted)	2,970	0	0
North Bros.	2,890	0	0
Cox	2,830	0	0
Gentry	2,750	0	0

North-street:—

Taylor & Grist	£3,120	0	0
Russell	2,899	0	0
Lolargan	2,840	0	0
Higgs	2,800	0	0
Jones & Co.	2,680	0	0
Nightingale	2,649	0	0
Swain	2,594	0	0
Morter	2,500	0	0
Gregar	2,490	0	0
Hearle	2,483	0	0
Reed	2,469	0	0
North Bros.	2,450	0	0
Cox (accepted)	2,400	0	0
Gentry	2,385	0	0

For sewerage of Tremadoc and Borth, for the Ynyscynhaiarn Local Board. Mr. Thomas Roberts, C.E.:—

Davies & Jones, Festiniog	£2,313	9	11
Hughes, Portmadoc	1,837	0	0
Owen, Portmadoc	1,800	0	0
Davies, Portmadoc (accepted)	1,762	2	0

For alterations and additions to farm house, Alconbury Weston, Hunts. Mr. Robt. Hutchinson, architect:—

Thackray & Son	£379	0	0
Whiteman	348	0	0
Childs & Gale	322	0	0
Lord	320	0	0
Howard	309	0	0
Murphy	298	0	0
W. Rowe (accepted)	280	0	0

For the erection of farm buildings, at The Hyde, Hendon. Mr. Robt. Hutchinson, architect:—

Kirby	£1,313	0	0
Donne	1,275	0	0
Lord	1,265	0	0
Thackray & Son	1,165	0	0
Wade & Edey	1,150	0	0
Francis	1,127	0	0
Saint & Son	1,100	0	0
Bunting	1,095	0	0

For the erection of farm buildings on the Slade Farm, Cricklewood. Mr. Robt. Hutchinson, architect:—

Kirby	£324	0	0
Lord	315	0	0
Wade & Edey	315	0	0
Thackray & Son	310	0	0
Donne	300	0	0
Francis	290	0	0
Saint & Son	280	0	0
Bunting	273	0	0

For alterations and additions to Eldon House, Streatham. Mr. R. Cruwys, architect, Bank-chambers, 451, Brixton-road. Quantities by Messrs. Franklin & Andrews:—

J. & C. Bowyer	£1,649	0	0
Maxwell Bros.	1,394	0	0
D. S. Rice	1,392	0	0
W. Downs	1,377	0	0
J. Smith & Sons	1,347	0	0
J. Taylor	1,247	0	0
G. Candler	1,210	0	0
J. Tyerman	1,208	0	0
W. Mason	1,193	0	0
J. Macey & Sons	1,169	0	0
Pack Bros., Brixton (accepted)	1,157	0	0

For alterations to Eldon Lodge, Streatham. Mr. R. Cruwys, architect:—
Mason, Streatham (accepted).

For the erection of a detached house, West Buckland. Mr. R. Cruwys, architect:—
Buckingham (accepted).

Fitzgerald Estate.—Mr. Round's tender was 1,087*l.*, instead of 1,187*l.*, as we were informed.

For new roads, sewers, and surface-water drains, for the British Land Company, Limited, on their estate at Wimbledon. Mr. Henry B. Michell, surveyor:—

Crockett, St. Pancras	£1,795	0	0
Killingback, Camden Town	1,789	0	0
McKenzie & Williams, London	1,733	0	0
Nowell & Robson, Kensington	1,712	0	0
Keeble, Regent's Park	1,700	0	0
Catley, Lloyd-square	1,550	0	0
Harris, Camberwell	1,527	0	0
Wilson, Walthamstow	1,444	0	0
Pizzey, Hornsey	1,422	0	0
Dunmore, Hornsey	1,363	0	0
Bloomfield, Tottenham	1,339	0	0
Jackson, Leyton	1,333	0	0
Peill & Sons,* Bromley, Kent	1,320	0	0

* Accepted.

For pipe-sewer and storm-water culvert, for the British Land Company, Limited, on their estate at Hornsey. Mr. Henry B. Michell, surveyor:—

Nowell & Robson, Kensington	£1,445	0	0
Catley, Lloyd-square	1,280	0	0
McKenzie & Williams, London	1,231	0	0
Pizzey, Hornsey	1,222	0	0
Crockett, St. Pancras	1,205	0	0
Killingback, Camden Town	1,148	0	0
Jackson, Leyton	1,111	0	0
Keeble, Regent's Park	1,100	0	0
Harris, Camberwell	1,050	0	0
Dunmore, Hornsey	1,049	0	0
Bloomfield, Tottenham	999	0	0
Wilson, Walthamstow	999	0	0
Peill & Sons,* Bromley, Kent	876	0	0

* Accepted.

For the erection and completion of a new Wesleyan Chapel, New Sueinton. Mr. Arthur Marshall, architect, Nottingham:—

Contract No. 2.

D. E. Lynam	£2,735	0	0
H. Vickers	2,675	0	0
F. Messom	2,350	0	0
Wooll Bros.	2,346	0	0
A. B. Clarke	2,346	0	0
E. Hind	2,298	0	0
Bell & Son	2,218	0	0
J. Jelley	2,207	0	0
Dudson & Parrish	2,125	0	0
G. Hewitt (accepted)	2,040	0	0

For additions and alterations to the Patriotic School for Boys, Wandsworth, for the Governor of the Westminster Emanuel Boys' School. Mr. H. Dawson, architect. Quantities by Mr. C. N. McIntyre North:—

Adamson & Son	£2,390	0	0
Smith & Son	2,112	0	0
G. Woodward	1,960	0	0
J. McLachlan & Sons	1,920	0	0

For cast-iron and earthenware pipe sewers, and other works, at Sutton Coldfield Sewerage Works. Mr. E. Pritchard, engineer, 27, Great George-street, Westminster. Quantities by Mr. E. J. Purnell, Coventry:—

Macrea & Macfarland, Dublin	£24,090	0	0
J. Bush, Ulverstone	16,569	10	10
W. R. Green, Ilfracombe	16,350	0	0
Baker & Sons, Barlborough	16,267	4	7
J. Garlick, Saltley	14,916	0	0
Fotherby & Son, Burnley	14,656	15	7
Dovener & Son, Sowerby Bridge	14,540	0	0
Jos. Evans, Aston	14,180	0	0
D. Shanks, Kirkcaldy	13,850	0	0
Jno. Fell, Leamington	12,750	0	0
Geo. Law, Kidderminster*	11,777	0	0
A. Palmer, Birmingham	11,585	0	0

* Accepted.

House Connexions and Private Drainage Works.
George Law (accepted).

For making roads and paths, building caretaker's house, boundary-wall, fences, &c., in the Havelock-road, Southall, for the Burial Board for the Parish of Norwood, Middlesex. Mr. Thos. Newell, architect, Dashwood House, New Broad-street. Quantities by Mr. Sidney Young:—

Woodham & Co., Catford	£1,274	0	0
H. R. Swain, London	1,085	0	0
W. Crockett, London	1,063	0	0
W. Brown, Southall	1,035	0	0
H. S. Pollard, London	993	0	0
F. Taylor, Uxbridge	969	0	0
T. Hiscock, Hounslow	950	0	0
C. Kearley, Uxbridge	925	0	0
P. Bell, Southall	890	0	0
French & Medcraft,* Hanwell	757	10	0

* Accepted.

For the erection of greenhouses, Aigburth Drier, Sefton Park, Liverpool, for Mr. E. L. Wigan. Mr. Walter W. Thomas, architect, 25, Lord-street, Liverpool:—

T. Urmson	£320	0	0
Heating with Hot Water.			
F. & J. Mee	117	9	0

For alterations to hospitals, Smithdown-road Workhouse, Liverpool, for the Toxteth Board of Guardians. Mr. Walter W. Thomas, architect:—

Jno. Titterington	£371	11	0
Heating the Sick Wards with Hot Water.			
Geo. Kneale	193	10	0
Reconstruction of Drainage.			
George Hall	377	0	0

For alterations to the public offices, 15, High Park-street, Liverpool, for the Toxteth Board of Guardians. Mr. Walter W. Thomas, architect:—

Jno. Titterington	£282	14	0
Extension of Heating.			
R. Renton Gibbs	68	0	0

For alteration of premises, 58 and 60, Lime-street, Liverpool, for Messrs. Hyam & Son. Mr. Walter W. Thomas, architect:—

Brown & Backhouse	£2,775	0	0
Fitting up Shop.			
Brown & Backhouse	347	14	0

For the erection of stables, in Brancker-street, Liverpool, for Mr. James Pratt. Mr. Walter W. Thomas, architect:—

Nicholson & Ayre	£339	0	0

For the erection of new shop, in Stafford-street, London-road, Liverpool, for Mr. Owen Owen. Mr. Walter W. Thomas, architect:—

Thos. Ray (carpenter & joiner)	£3,658	0	0
J. Henshaw (bricklayer)	1,971	0	0
Homan & Rodgers (smith and iron-founder)	1,482	0	0
J. & J. Sanders (mason)	1,395	0	0
Thos. Lea (plumber, painter, and glazier)	1,069	0	0
W. Callaghan & Son (slater and plasterer)	500	0	0

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WHY BURN GAS?—CHAPPUIS' REFLECTORS DIFFUSE DAYLIGHT.—They are exclusively adopted by and fitted at Buckingham Palace, all H.M. Government Offices, Houses of Parliament, H.M. First Commissioner of Works, the Metropolitan Board of Works, British Museum, South Kensington Museum, Royal Institution, Guildhall Museum, on board H.M. Ships, also Railway Companies' Offices, Hospitals, Institutions, Banks, Insurance Offices, Manufactories, Private Houses and generally from Noblemen's Mansions to Artisans' Workshops. 30,000 in use in London alone. Patronised by leading Architects, Engineers, Contractors, &c., &c.

N.B.—For Prospectuses and Diagrams, address Stamped Envelope to

P. E. CHAPPUIS, Patentee and Manufacturer, 69, FLEET-STREET, LONDON.

NOTICE.—The POLYGONAL REFLECTOR (Latest Patent) FOR ARTISTIC and PICTURE GALLERIES.
Its construction allows of the angle of light being readily altered so as to reflect in any desirable direction.